

SAP Process Mining by **celonis** 4.2

Manual

Software Version: 4.2

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SAP Process Mining by Celonis 4.2

Documentation

SAP Process Mining by Celonis 4.2

Documentation

Welcome to SAP Process Mining by Celonis 4.2!

This manual will help you dive into the world of Process Mining. With SAP Process Mining by Celonis 4.2, interacting with Process Analyses has become incredibly easy, user-friendly and efficient. Our vision is to make data analysis as intuitive as conducting a simple Google search.

Your SAP based data will be connected to your SAP Process Mining by Celonis 4.2 installation and can be used for any analysis.

Depending on your user role and your purpose of using SAP Process Mining by Celonis 4.2, different chapters of this documentation might be of interest for you:



Viewer

This will provide you with the basic knowledge you need to know to work with existing Analysis.



Analysist

An Analyst can create and edit own analysis. Therefore, this chapter explains all tools of SAP Process Mining by Celonis 4.2 in detail.



Data Scientist

This chapter is meant to explain the Data - Integration process. Furthermore, you will be supplied with knowledge about Reporting Tools, Transports and Templates.



Administrator

Learn how to administrate and update your SAP Process Mining by Celonis 4.2 Installation.



Get in touch!

If you encounter any problems with your Software, please do not hesitate to contact our **Service desk!**

Hotline: +49 (0) 89 416 159677

Service: 8:30 - 17:00 CET (Monday - Friday)

E-Mail: servicedesk@Celonis.de

URL: <https://servicedesk.celonis.de>

1 INTRODUCTION

This chapter explains how to install and activate your SAP Process Mining by Celonis 4.2 Software.

For more Information on your First Steps in the SAP Process Mining by Celonis 4.2 Software, please refer to the Getting Started chapter.

What's Inside?



System Requirements

Installation

License Management

Start with reviewing your [System Requirements](#)!

1.1 SYSTEM REQUIREMENTS

We do strongly recommend to check the following System Requirements prior to your SAP Process Mining by Celonis 4.2 Installation, in order to avoid possible errors during the installation or your work with SAP Process Mining by Celonis 4.2.

- Windows Server: supported 2008 R2 SP1, 2012, 2012 R2, recommended 2012 R2
- RHEL: supported 6.5 and later, recommended 7.2
- SLES: supported 11 SP3 and later, recommended 12
- Ubuntu: supported 12.04 LTS and 14.04 LTS, recommended 14.04 LTS

1.2 INSTALLATION

Please refer to the *Installation Guide* for installation instructions.

The installation guide only covers the basic installation topics. For advanced information on how to successfully and securely operate SAP Process Mining by Celonis 4.2, please refer to the *Operation Guide*.

1.3 LICENSE MANAGEMENT

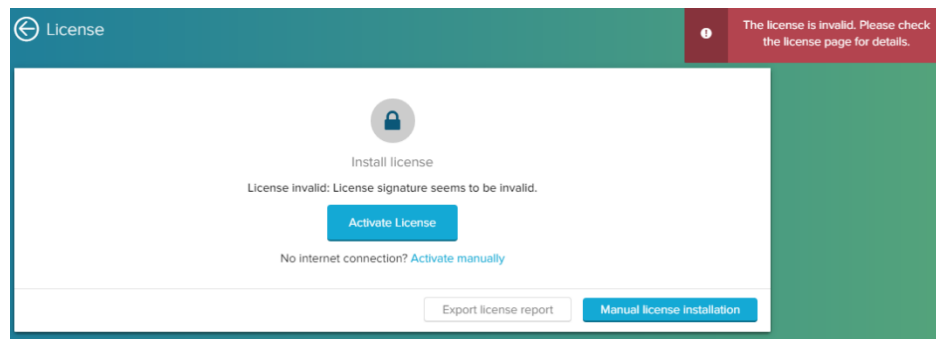
Before you can use SAP Process Mining by Celonis 4.2, you need to activate your License.

myCelonis

To activate your License, you need your credentials for the www.my.celonis.de platform.

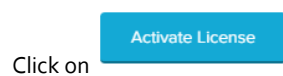
If you are facing problems with the myCelonis platform, you can use the "Forgot Your Password?" link.

After opening the Software for the first time, you will be directed to the License Management:



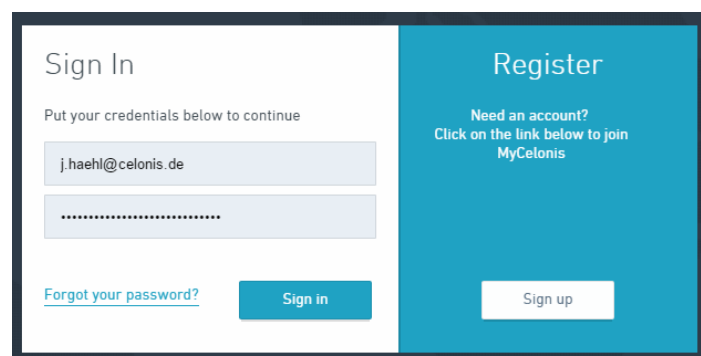
You can Activate your License Online. If the Online License Activation fails for any reason, please try the Manual License Installation.

▼ Online Activation



Click on

The my.celonis platform appears in the SAP Process Mining by Celonis 4.2 Frame. Please Sign In with your credentials to continue:



Choose your license (if you purchased more than one license) and click on "Activate":

Activate your Celonis License

We found a valid license which you can use in your installation. Please select the license to use and confirm the installation.

Activate your Celonis License

License id: Celonis Employee Single Demo Li ▼

Activate

You will be forwarded to the License Manager in your SAP Process Mining by Celonis 4.2 Software, with a small pop-up appearing ("Your License has been uploaded").

Your license

Here you can find information about your installed license.
If you have questions concerning your license parameters, please contact Celonis support.

License name	Celonis Employee Single Demo License
Machine ID	3508-7791-7637-3720
Valid until	Jan 1, 2017
Maximum number of events	5000000
Number of data models	10 (2 in use)

Export license report Manual license installation

Your license has now been activated, let's [Get Started](#) with SAP Process Mining by Celonis 4.2!

▼ Manual License Installation

Click on

Manual license installation

You will be asked for a license key:



License

Here you can install a new license manually by going to [myCelonis](#) and claiming a license from there. Copy the license key from myCelonis and paste it to the input box. Alternatively, you can use the auto installation mechanism which will retrieve your license automatically. Note that this is only possible when you are connected to the internet.

You will need your Server ID: XXXXXXXXXX

Paste your license key here.

Activate online

Install license

To obtain your license key, go to www.my.celonis.de and sign in with your credentials:

Sign In

Put your credentials below to continue

j.haehl@celonis.de

.....

[Forgot your password?](#)

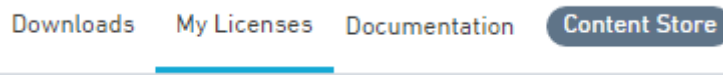
Sign in

Register

Need an account?
Click on the link below to join MyCelonis

Sign up

Click on "My Licenses" in the menu:



Choose your license in the License Menu, and click on the desired license:

Search	
License Name	Valid Until
Celonis Employee Enterprise Demo License	January 1, 2017 00:00
Celonis Employee Single Demo License	January 1, 2017 00:00

The License Details will show up:

License Details for
Celonis Employee Single Demo License

License Name
Celonis Employee Single Demo License

Edition
CPM4_PROFESSIONAL

User Count
1

Number of Events
5000000

Number of Data Models
10

Valid until
January 1, 2017 00:00

Your license has been activated. If you want to re-install it into your CPM4 installation, just copy and paste the license key into the licensing page or navigate to the licensing page in the CPM4 Software

Server ID

License Key (Copy into your CPM Installation)

Download installer

Server ID

Every SAP Process Mining by Celonis 4.2 Installation is associated with a unique Server ID. After your license has been activated in a SAP Process Mining by Celonis 4.2 installation, the Server ID in your SAP Process Mining by Celonis 4.2 Software will match the displayed Server ID in the myCelonis platform.

Copy the License Key and paste it into your SAP Process Mining by Celonis 4.2 Software:



License

Here you can install a new license manually by going to [myCelonis](#) and claiming a license from there. Copy the license key from myCelonis and paste it to the input box. Alternatively, you can use the auto installation mechanism which will retrieve your license automatically. Note that this is only possible when you are connected to the internet.

You will need your Server ID: **3508-7791-7637-3720**

[Activate online](#)[Install license](#)

To Activate the License, click on [Install license](#). A small pop-up will appear ("Your License has been uploaded").

If your License Key has been valid, you will be forwarded to the Home Page of SAP Process Mining by Celonis 4.2.

Let's [Get Started!](#)

License Support:

If you encounter any problems activating your License, please contact the SAP Process Mining by Celonis 4.2 Support.

2 GETTING STARTED

This chapter will help you with your first steps in SAP Process Mining by Celonis 4.2. It will explain the basic **structure** and provide all necessary **tools** to work with Analyses.

Furthermore, we will introduce our **Case Study**, that will be developed in the whole documentation.

What's Inside?



Structure

Login

Homescreen

2.1 STRUCTURE

This section helps you to understand the basic structure of SAP Process Mining by Celonis 4.2.

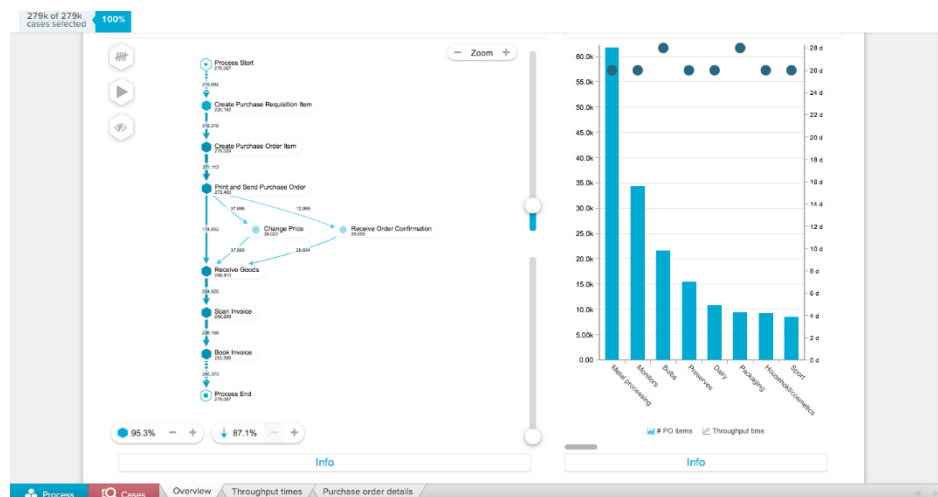
Our algorithms rely on the basic fact that all documented interactions in an operational business process leave digital *footprints*. These can be connected and transformed for the use in the SAP Process Mining by Celonis 4.2 Software.

Don't Worry!

You do not need to understand the Structure of SAP Process Mining by Celonis 4.2 in order to interact with existing Analysis (you may directly skip to [Login](#) or to the [Viewer](#) chapter).

However, it is important to know Data Models and their relations when it comes to the creation of Analysis Documents.

At first glance, users of SAP Process Mining by Celonis 4.2 are interacting with [Analysis Documents](#). Here is an example:

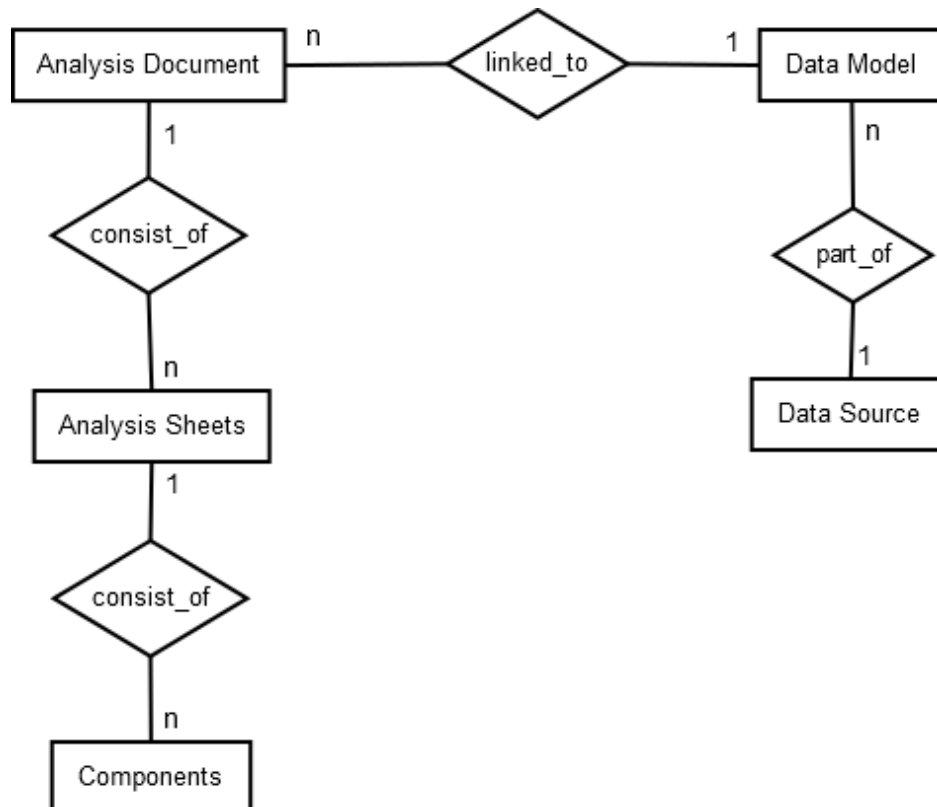


Analysis Documents can consist of one or several Sheets, which is a great way to structure Analysis Documents. As you can easily observe on the picture above, Analysis Sheets consist of various diagrams, charts and other **components**.

Their purpose and interaction possibilities are explained in the [Viewer](#) chapter, their Set-Up and configuration can be found in the [Data Scientist](#) chapter. However, Analysis Sheets do not include any data themselves. They consist of various components, which are based on KPIs (we will deal with KPIs in the [Data Scientist](#) chapter).

The underlying Data however is taken from an associated **Data Model**. For now, it is enough to understand that a [Data Model](#) includes all the data that we need to construct the Process Analysis. Each Analysis Document is linked to (exactly) one Data Model.

Data Models are created based on **Data Sources**, which is most likely a database or any other file. To learn more about Data Models, please refer to the [Data Scientist](#) chapter.



To structure Analysis Documents and Data Models, SAP Process Mining by Celonis 4.2 introduces **Projects**. Projects consist of at least one Analysis Document and the associated Data Models and can be used as entities of SAP Process Mining by Celonis 4.2, when it comes to access-rights. In SAP Process Mining by Celonis 4.2, every Analysis Document and every Data Model is part of one distinct project. Data Sources can however exist globally (one Data Source can be used in various Data Models among different projects). Another great possibility to structure your Analysis Documents are **Folders**. Folders (and further Subfolders) can be created at any level in a project, to structure Analysis Documents.

Icons

The following icons are used in SAP Process Mining by Celonis 4.2:



Analysis Document



Data Model



Projects



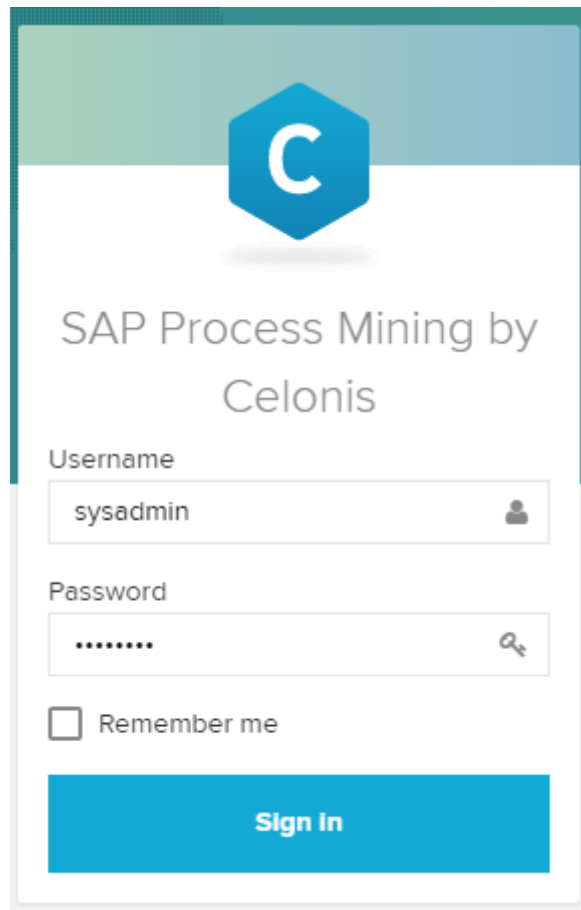
Folders

You will find these icons when interacting with the [Homescreen](#).

2.2 LOGIN

To open the SAP Process Mining by Celonis 4.2 web application, please enter the URL of your SAP Process Mining by Celonis 4.2 instance in your browser.

The following screen will appear:



Please fill out your assigned Username and your Password, and proceed with

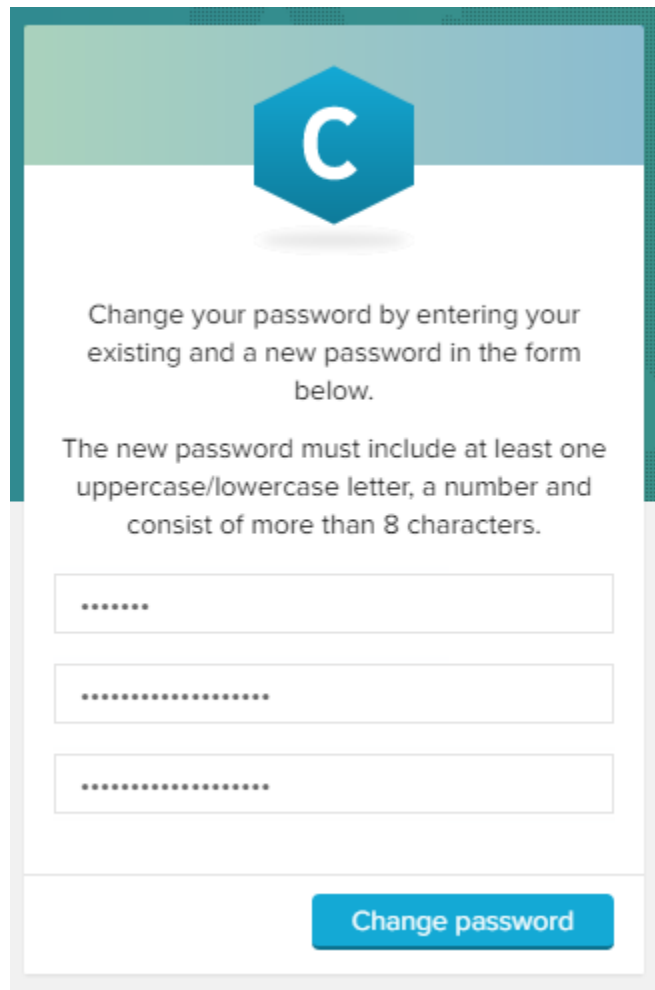
Sign in

Any Problems?

Please contact your System Administrator, if you are facing problems with your credentials or the SAP Process Mining by Celonis 4.2 URL. Use "Remember Me" to stay logged in the SAP Process Mining by Celonis 4.2 Application, until you sign out manually.

First Login

If this is the first time that you sign in to the SAP Process Mining by Celonis 4.2 application, you might be asked to change your password.



Please fill out the old password and choose a new password.

The password has to meet your corporate security policy, which is set by your System Administrator.

By default, your new password should consist of more than 8 characters, including at least each one uppercase - and lower-case letter and a number. Consider the [Operation Guide](#) for more details on security parameters.

2.3 HOMESCREEN

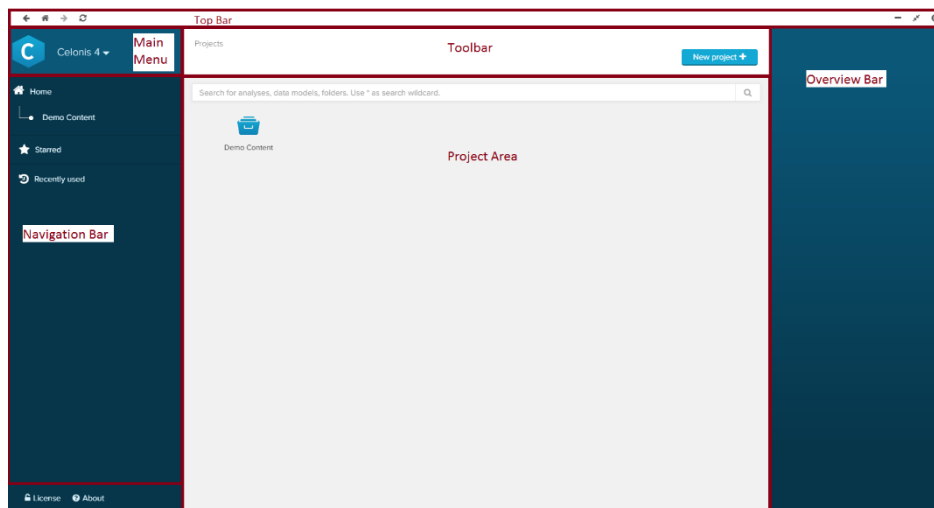
The Homescreen is the centre of the SAP Process Mining by Celonis 4.2 application. It provides access to all parts of the software and to all available Process Analysis.

Please Note:

In the Enterprise Server Edition, different users may have different **access rights** on objects (Projects, Analysis Documents, Data Models). For this reason, you will only see objects that you created or that you have been granted access.

Access rights for single objects and Projects are explained in the [Data Scientist](#) chapter.

The Homescreen is structured in the following parts:



Top Bar

The Top Bar is visible in the whole SAP Process Mining by Celonis 4.2 Application.



- Go back to the previous screen
- Go to the previous screen, if you used the "Back" option.
- Use the home symbol to go back to the Homescreen.
- Refresh the current screen

Project Area

The Project Area shows all Projects. As we already learned in the [Structure](#) chapter, Projects are global folders for Analysis Documents and their Data models, which can be further structured in folders and subfolders within a project.

To **open** any object in the Project Area, double-click on it.




To **select** an object (without opening it), single-click on it.

In the upper part of the Project Area, you will find a Search Field:

You can use it to search for any objects at any level in the Project Area.

Overview Bar

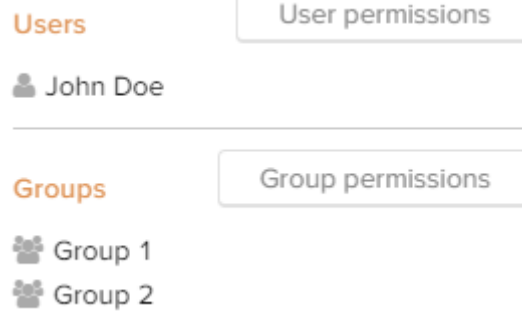
The Overview Bar will show details to the selected object:

 Demo Content <div> <div>Created on</div> <div>Aug 3, 2016</div> </div> <div> <div>Starred</div> <div>☆</div> </div> <hr/> <div> <div>Last change</div> <div>6 days ago</div> </div>	 P2P - Demo <div> <div>Created on</div> <div>Aug 3, 2016</div> </div> <div> <div>Starred</div> <div>★</div> </div> <hr/> <div> <div>Last change</div> <div>6 days ago</div> </div> <div> <div>Data model</div> <div>P2P Dm Small</div> </div>	 P2P Dm Small <div> <div>Created on</div> <div>Aug 3, 2016</div> </div> <div> <div>Starred</div> <div>☆</div> </div> <hr/> <div> <div>Last change</div> <div>a few seconds ago</div> </div> <div> <div>Used by analyses</div> <div>P2P - Demo</div> </div>
---	--	---

Sample Overviews of a **Project** (left), an **Analysis Document** (centre) and a **Data Model** (right)

For all objects, this view will show the Creation Date and the last time that anybody made changes to this document. For Data Models and Analysis Documents, you will furthermore see the connections between the Analysis Documents and the Data Models.

In the **Enterprise Server Edition**, the Overview Bar is extended by a user management and a group management for each object:



You can use "User permissions" and "Group permissions" to assign various rights on the selected object to different users.

More on that can be found in the [Data Scientist](#) chapter.

Toolbar

The Toolbar offers options to edit the selected object.



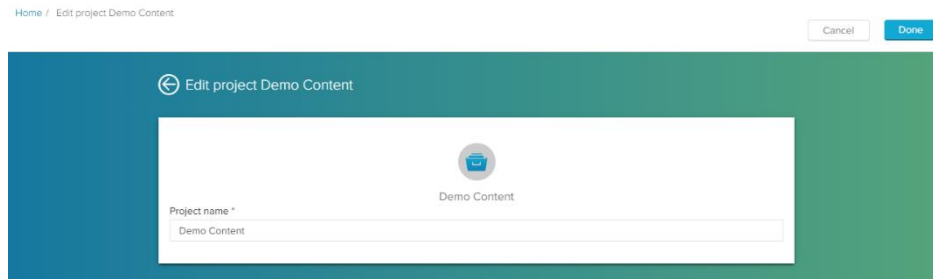
*Toolbar options for **Projects** (left) and **Analysis Documents/Data Models** (right)*

Open:

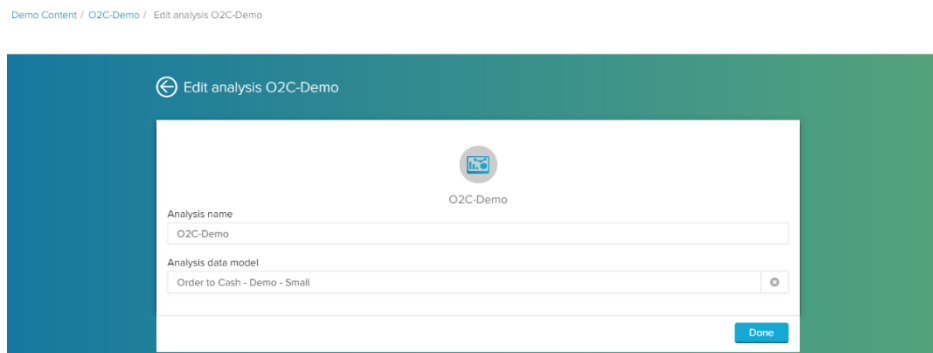
Click here to open the selected object.

Edit:


Edit allows you to change the name of the selected object, and to assign a new Data Model to your Analysis Document.



Assign a new name to your Project or your Data Model.



Assign a new name and/or a new Data Model to your Analysis Document.

Confirm your changes with .

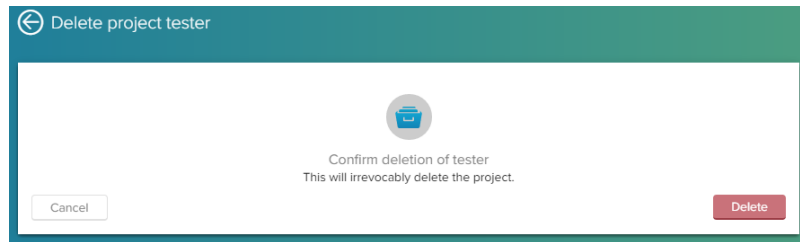
Delete:

Use Delete to permanently remove the selected object from the SAP Process Mining by Celonis 4.2 application.

Attention:

You can't recover a single object after it has been deleted.

You will be asked once again before the object will be deleted. This is to prevent unintended deletions.



Confirm with  .

Duplicate:

When you click on Duplicate, all included Analysis Documents and Data Models will be copied to a new Project. The new Project's name will carry a "-Copy" extension. You may use the "Edit" option to rename it.

Cut/Copy & Paste:

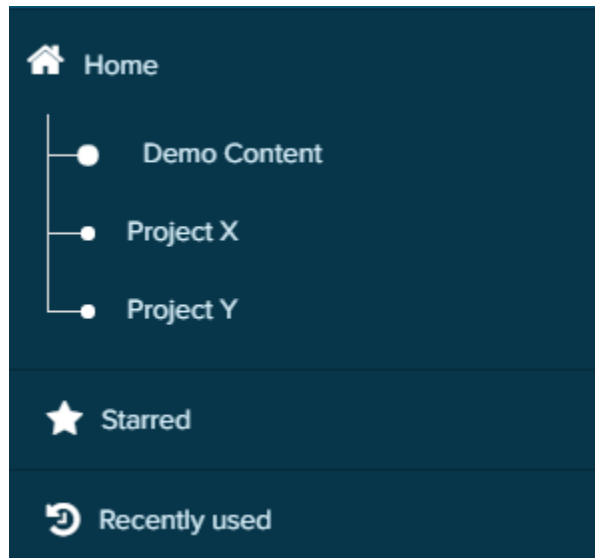
As already mentioned, Projects are folder structures and can consist of an unlimited number of subfolders. Included objects (Analysis Documents and Data Models) can be treated like documents in a File Browser. You can cut or copy any object, and paste it at its new destination.

You can even do this among different projects. However, only copying an Analysis Document or a Data Model to another Project does not include the linkage to its prior Data Model / Analysis Document.

Most likely, you will have to cut/copy both the Data Model and the Analysis Document, and reconnect them in the new Project by editing the Analysis Document.


Navigation Bar



The Navigation Bar includes all available Projects in its upper part.




This allows you to quickly open another project at any time in the Homescreen.

Starred:

The  Starred function allows you to highlight any object, using the Overview Bar.

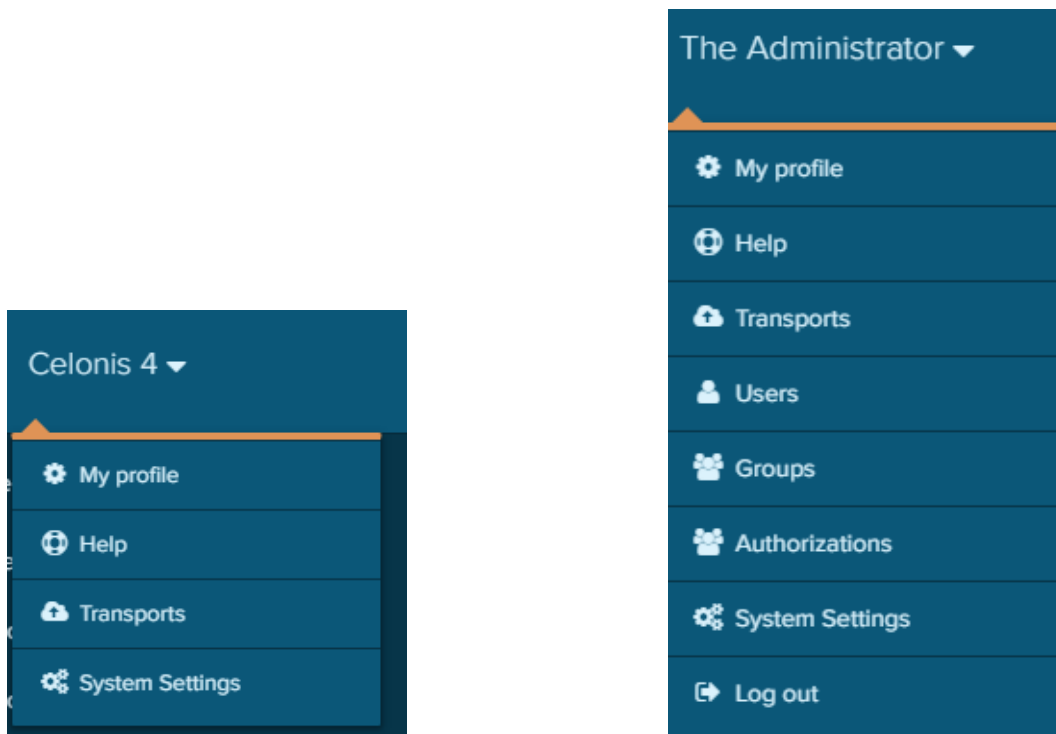
Just click on the  option, which will mark the object as Starred (), and put a link to this object in this Starred Section.

Recently used:

The  Recently used section features all objects across all available Projects, that you have been used (opened or edited) recently.

2.3.1 MAIN MENU

The Main Menu can be opened as a drop-down menu with a click on the blue button in the upper left part of the Homescreen:



On the subpages, you will find detailed descriptions to all menu items:

[My Profile](#)

[Help](#)

[Transports](#)

[Users, Groups & Authorizations](#)

[System Settings](#)

2.3.1.1 My Profile

In the "My profile" section, you can edit your personal settings. These settings vary, according to your Software version:

My profile

General settings

Username
max.mustermann

First name
Max

Last name
Mustermann

Email
j.haehl@celonis.de

Company

☒ Enable getting started guide

Password
[Change password](#)

Language

☒ English
☐ German
☐ Dutch

Separators

Decimal separator
☒ Use language standard for decimal separators

Thousand separator
☒ Use language standard for thousand separators

Name mapping settings
☐ Display technical names

Cancel Save changes

"Enable getting started guide":

If you enable this option, you will be led through your first steps in the SAP Process Mining by Celonis 4.2 application by blue boxes with certain tips and instructions, as soon as you start the software.

Language:

You can choose between English, German and Dutch.

Separators:

Here you may specify decimal and thousand separators.

The default settings for the different languages are:

Language	Decimal separator	Thousand separator
English	.	,
German	,	.
Dutch	.	,

However, you may of course specify any character that you like.

You can reactivate the default settings for both separators with the "Use language standard" fields.

Name mapping settings:

The components in any Analysis Document show data that is based on the column names of their data source.

For this reason, you will see the column names in the components (for example in tables or in the legend of a chart).

As these column names are not always very intuitively, name mappings can be assigned in the Data Model (by a Data Scientist) to "rename" these technical names with pre-defined display names in the components (name mappings do not change the actual column name).

If your Data Scientist made use of name mappings in his Data Model, you will see the display names instead of the actual column names.

If this is the case, but you still want to see the actual column name, you can activate "Display technical names".

This will add the actual column name in [] brackets after the display names.

Example of a P2P - Process

Let's assume that in our Database we have a table listing all Purchase Requisition Items. One column, including all Requisition Items, might be called BNFRO in our Database.

As we want a lot of viewers to work with this analysis, the Data Scientist has added a Name Mapping - replacing BNFRO with "Purchase Requisition Item" to be displayed in all components.

If you still want to see both the display and the actual column name in your Analysis Documents, you can activate "Display technical names" here.

Your components will then show "Purchase Requisition Item [BNFRO]".

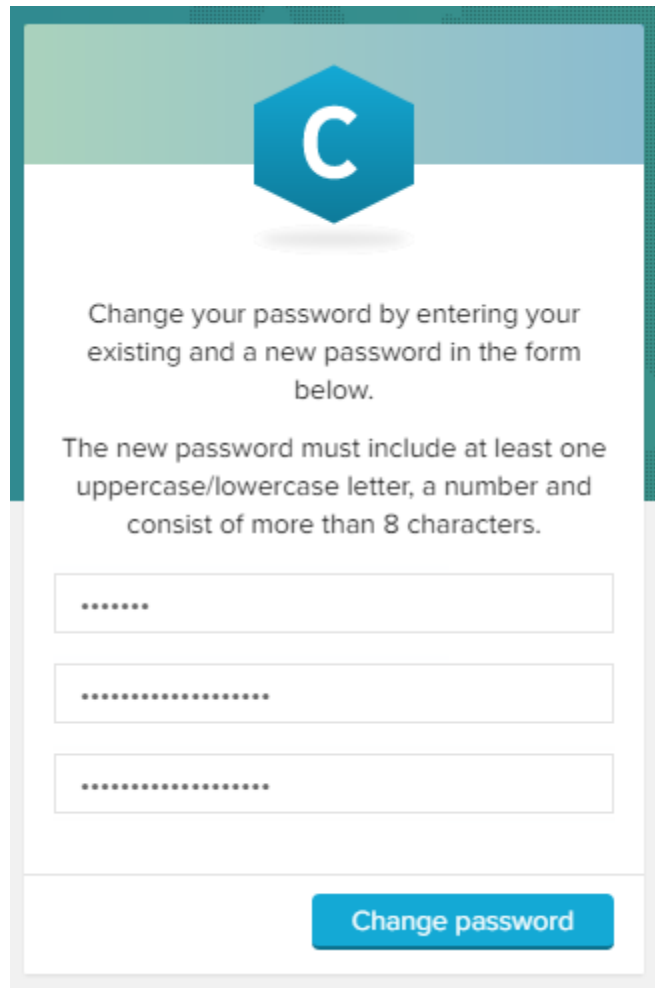
First name, last name, email, company:

You can change your first name, your last name, your E-Mail address and your company name with these fields. However, you cannot change your username on your own.

Password:

To change your personal password, click on "Change password".

The following screen will appear:





The screenshot shows a web form for changing a password. At the top is the Celonis logo, a blue hexagon with a white 'C'. Below the logo, the text reads: "Change your password by entering your existing and a new password in the form below." followed by "The new password must include at least one uppercase/lowercase letter, a number and consist of more than 8 characters." There are three input fields: the first for the existing password (containing six dots), the second for the new password (containing thirteen dots), and the third for the confirmation password (containing thirteen dots). At the bottom right of the form is a blue button labeled "Change password".

Fill out your old password, set a new password and confirm it.

Your new password has to meet your corporate security policy, which can be defined by System Administrators.

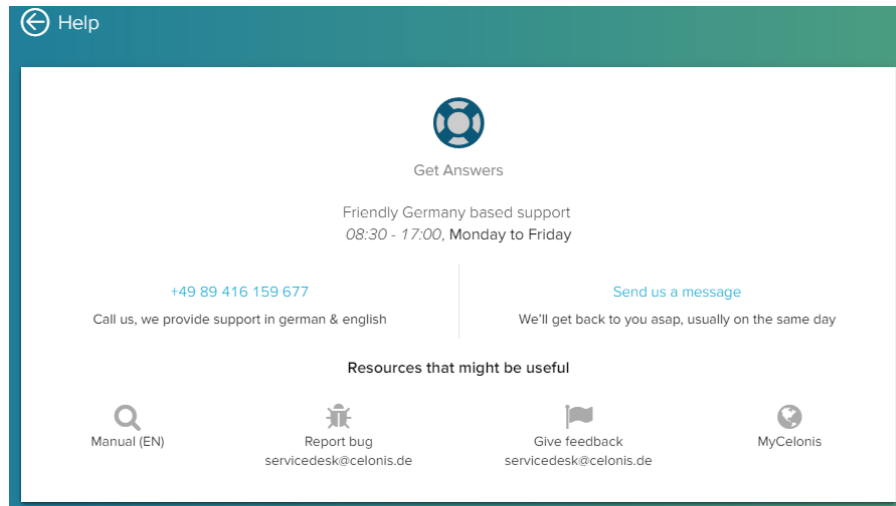
By default, your password should contain more than 8 characters, at least each one uppercase and lowercase letter and a number.

Confirm your changes with .

Don't forget to save your changes with .

2.3.1.2 Help

Click on Help to get an overview of our support.



▼ Manual

You are currently reading the Manual 😊

▼ Report bug

With this link you will write an E-Mail to servicedesk@celonis.de. You can report any bugs that occur in the software.

▼ Feedback

With this link you will write an E-Mail to servicedesk@celonis.de. We want to improve our product and your experience. For this reason, we are happy to get your feedback!

▼ MyCelonis

This link will redirect you to the www.my.celonis.de platform, where you can access various further resources, the content store, tutorials, manage your [licenses](#) and download our latest releases.



Get in touch!

If you encounter any problems with your Software, please do not hesitate to contact our **Service desk!**

Hotline: +49 (0) 89 416 159677

Service: 8:30 - 17:00 CET (Monday - Friday)

E-Mail: servicedesk@celonis.de

URL: <https://servicedesk.celonis.de>

2.3.1.3 Transports

Transports are a useful way to import / export projects, including the Data Sources, Data Models and Analysis Documents.

Please follow the instructions provided in [Manage Transports](#).

2.3.1.4 Users, Groups & Authorizations

User Administrator

You need to be a [User Administrator](#) to Manage Users, Groups and Authorizations.



Manage Users.



Manage Groups.



Manage Authorizations.

Authorizations

Authorization objects are typically used to restrict access for users/groups to the data necessary for their field of work. This can be for example regional (by market, country, and continent), division (company code) or client based.

Please Note

If you want to manage the user access to certain analysis objects (Projects, Analysis Documents, Data Models), please proceed to [Permissions](#).

2.3.1.5 System Settings

You are required to be a [System Administrator](#). All System Settings are explained in detail in the [Global System Settings](#).

3 VIEWER

Welcome to the Viewer chapter!

In this chapter, you will learn how to work and interact with existing analyses.

What's Inside?



[Analysis Document](#)

[Process \(Explorer\)](#)

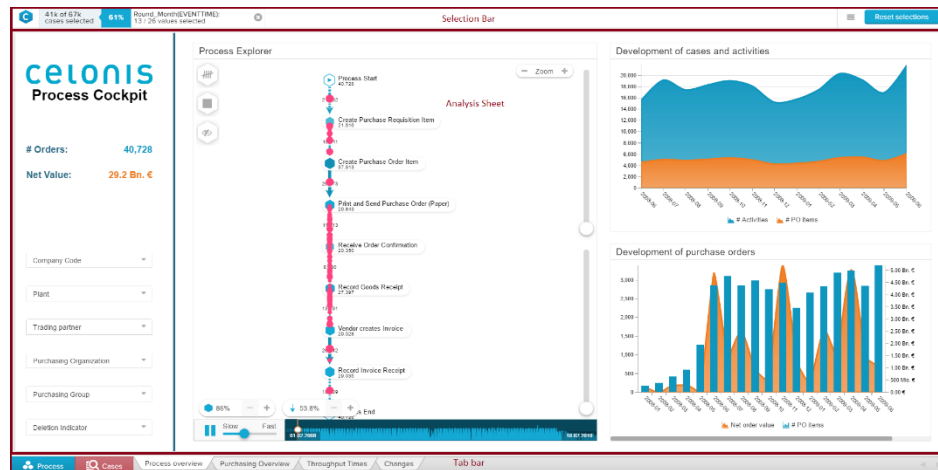
[Case \(Explorer\)](#)

[Selections](#)

[Stories](#)

3.1 ANALYSIS DOCUMENT

Each Analysis Document consists of different parts.



The **Selection Bar** displays all active selections.

A selection can be applied to any data from any component.

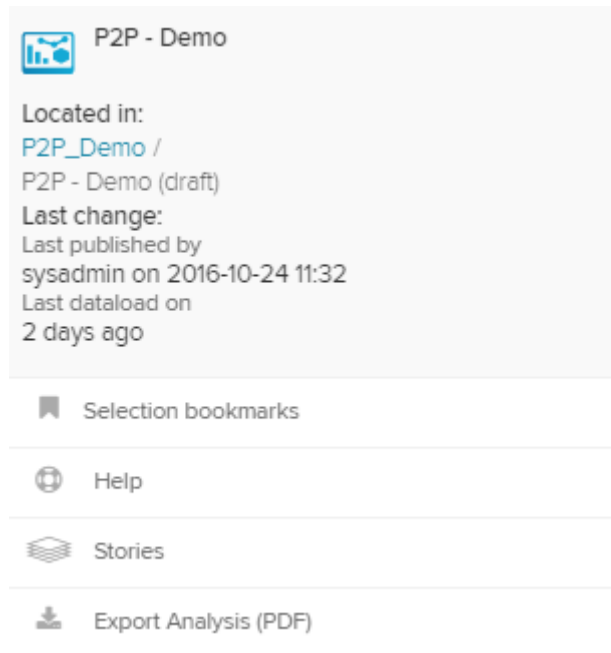
You can use selections to focus your analysis on a certain range of data, e.g. for the year 2015.

[Learn more about sections!](#)

On the right side of the selection bar, you can furthermore access the **document tools** with the following icon:



This will open the following dropdown menu:



With these buttons, you can access the [Selection bookmarks](#), open the help section (see below), create and manage your [Stories](#) or export and download the current analysis document as a pdf-document to your local hard drive.

Every Analysis Document consists of one or multiple **Analysis Sheets**. They carry all [Components](#) and provide the user interface for your work with SAP Process Mining by Celonis 4.2.

To change between the different components, the **Tab Bar** has been introduced.

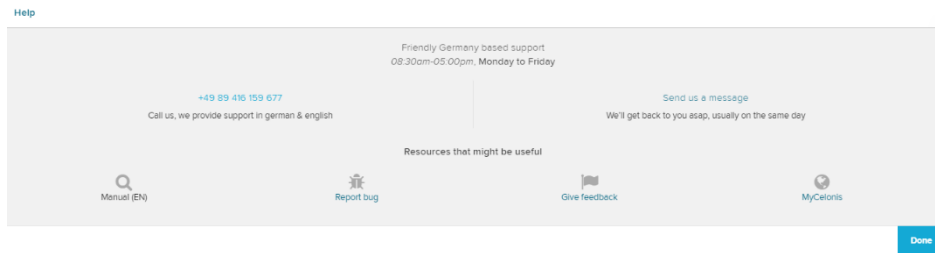


On the right side of the Tab Bar, you can see all available Analysis Sheets. Click on any sheet to open it

Help

The Help section can be accessed in the above described document tools.

The following help & support resources are available:



You can access this manual, report a bug (via e-mail), give feedback (via e-mail) or go to the [My.Celonis](#) platform, where you can manage your licenses and access the Content Store and demo data.

Furthermore, you can at any time contact our Service desk!



Process Explorer

[Click here](#) and learn how to interact with the default Process Explorer.



Case Explorer

[Click here](#) and learn how to work with the Case Explorer.



Selections

[Click here](#) to learn how to apply your own Selections.



Components

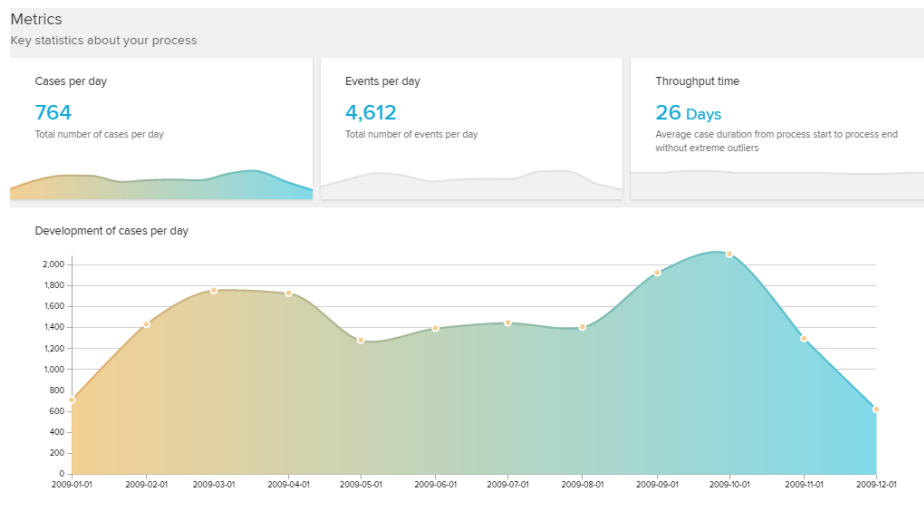
[Click here](#) if you want to know more about the available components.

3.2 PROCESS OVERVIEW

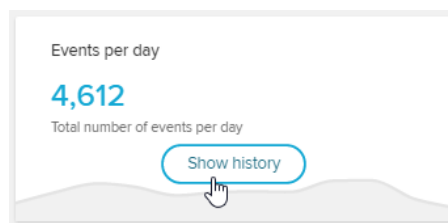
The Process Overview App provides the user with a summary and entrypoint to any process analyses. The most important process metrics for any process are summarized in three sections.

Overview

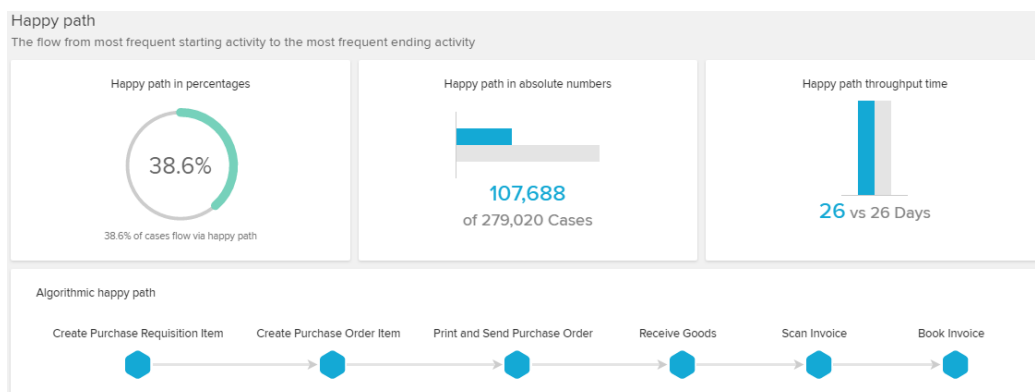
In the overview, first, the time trend for cases per day, events per day and the total throughput time are shown in an area chart:



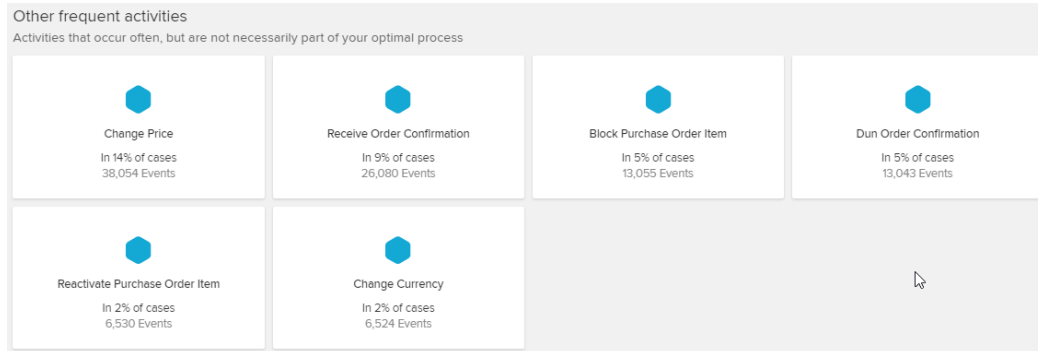
The charts content can be selected via the tiles on top with a click on the single KPI's tile:



Additionally the Process Overview provides the key insights on your process' Happy Path, the main flow through the process. The case coverage of the Happy Path in percentage and total numbers as well as the throughput time of the Happy Path compared to all other cases are shown:

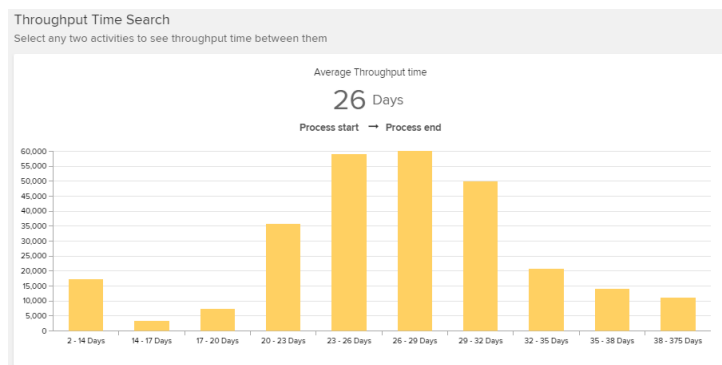


Other frequent activities, not covered with the Happy Path are shown in tiles as the last information to the process. The case total number of cases and also the ratio in percentage of cases that flow through these cases are shown in the tiles. Clicking on the tile will open the activities profile:

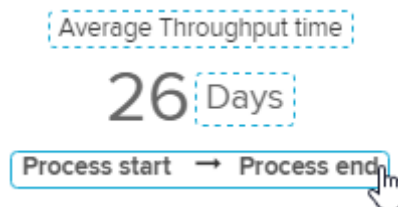


Throughput times

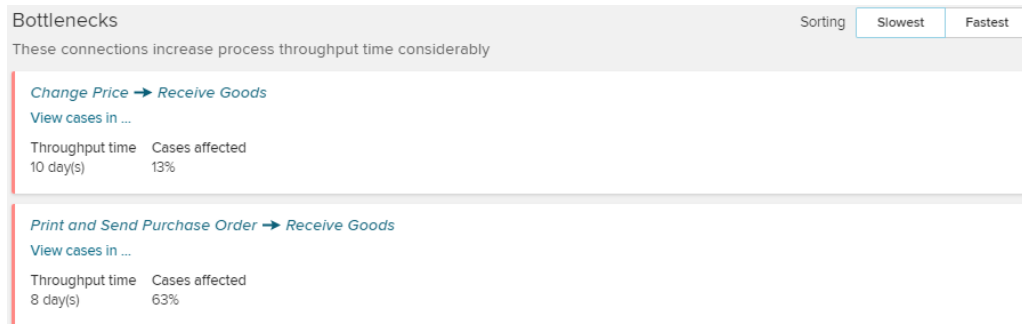
In the throughput time section the throughput times of the process are shown. An histogram visualizes how the cases throughput time is distributed:



It is possible to change the calculation method, the unit and the starting and ending activity for the throughput time calculation in the histogram. To change one of these settings, simply click on the corresponding text above the histogram:

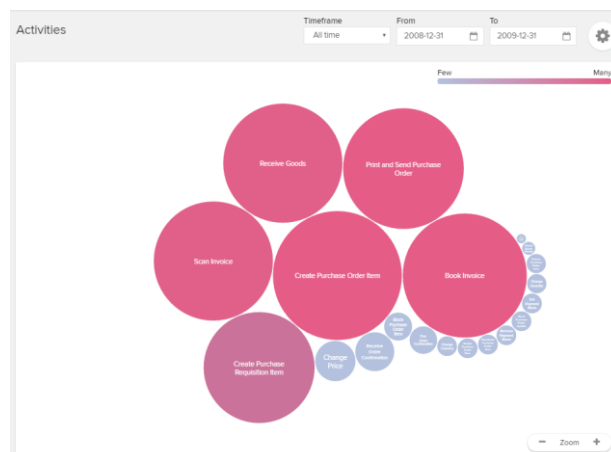


A second insight provided in the throughput time section, are bottlenecks within the process. Connections with significant occurrence and long throughput times are listed in a feed. Clicking on [View cases in ...](#) allows to select the affected cases and analyse them further in another sheet:

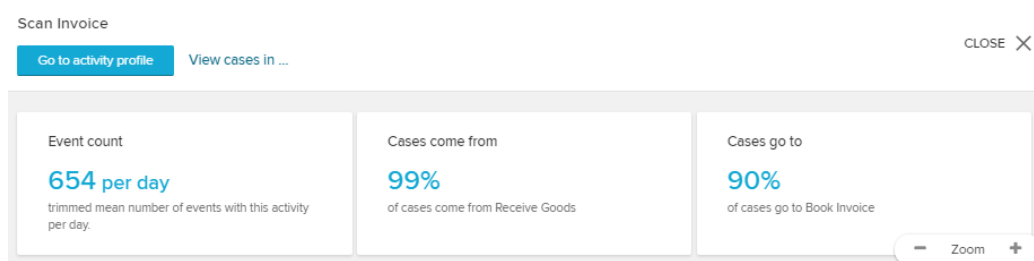


Activities

The third section in the Process Overview analyzes the single activities within the process. An entrypoint to this part is a bubblechart showing the frequency of the single activities in the bubble size and color scheme:



By clicking on a single activity will show further details on this activity. The exact number of events, previous activities and following activities:



[Go to activity profile](#)

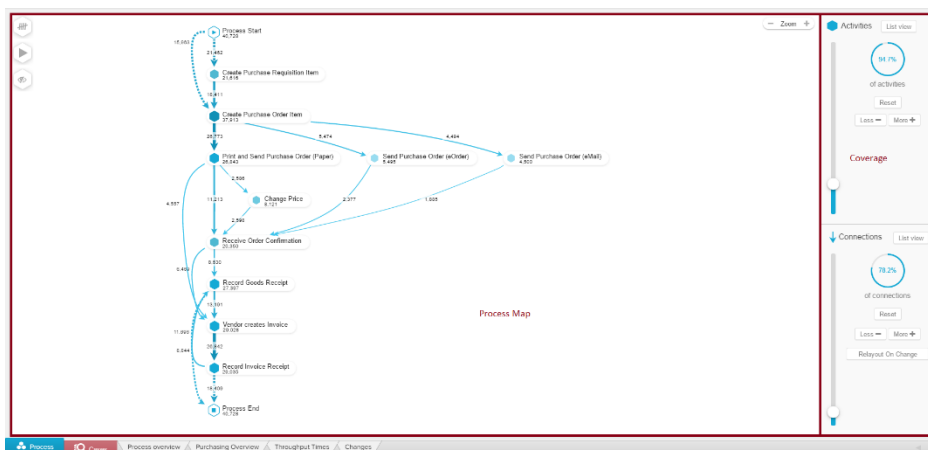
It is possible to see details on each activity in the activity profile by clicking on:

The activity profile shows the time trend on the execution of the activity as well as the daily distribution, to which times of the day was the activity executed.

3.3 PROCESS (EXPLORER)

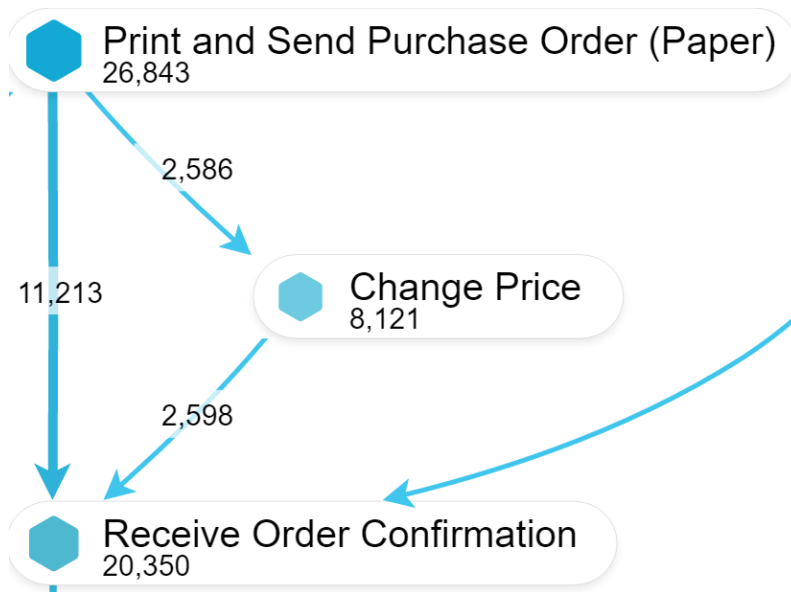
The **Process Explorer** is the core element of SAP Process Mining by Celonis 4.2, a powerful instrument making it possible to visualize and analyse processes.

In the following figure, you can see an exemplary display of the process explorer, showing all its different features which will be explained throughout the following sections.



The Process Explorer was designed to show processes in the most intuitive and flexible manner: **As a process model!**

Different activities will be displayed as **nodes**, transitions between activities as **edges**.



Nodes & Edges

Every node and edge will show the total number of cases passing through it, based on the current [Selection](#).

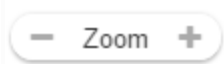
This number is visually supported by the thickness and the color intensity of all nodes and edges.

The more cases pass through this activity or transitions, the thicker and darker its color will be.

Zoom & View

Use your mouse to move across the process map. You can furthermore use your mouse wheel to zoom.

Additionally, these buttons might help you:



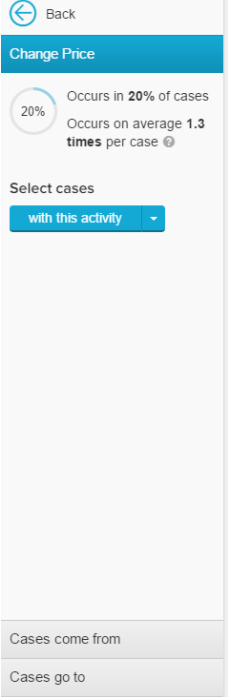

Use the - / + buttons to zoom out / in.

If you hover "Zoom", "Reset" will appear. Click on "Reset" to get back to the initial view.

Details

If you select (left-click) any activity or any connection in your process map, the former Coverage Bar will now show details of your selection.

To explain these details, we will focus on the "Change Price" activity with its (incoming and outgoing) connections.

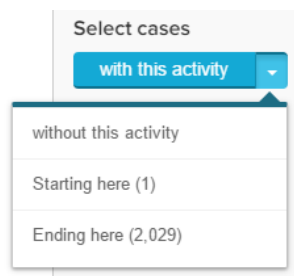
	
<h3>Activity Details</h3> <p>In the upper part, you will see quantitative measures about the occurrence of the selected activity.</p> <p>Please Note</p> <p>These measures are based on the current Selection.</p>	<h3>Connection Details</h3> <p>In the upper part, you will see the quantitative occurrence of this connection, calculated upon your current Selection.</p>

Activity Details

Select cases

You can apply new Selections to get a deeper understanding of this activity using **with this activity**.

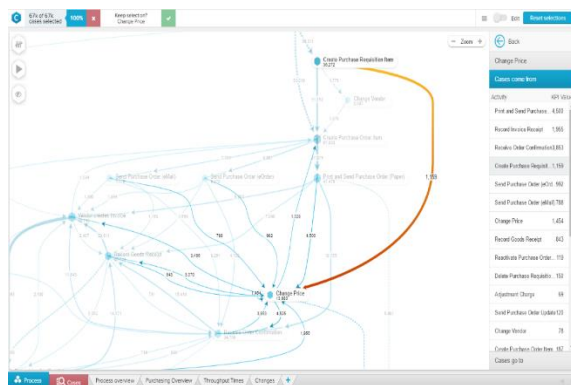
The white arrow on the right side will open a drop-down menu, offering the same selection possibilities as already explained above.



Case come from

The **Cases come from** button will open a list with all previous activities of the selected activity, based on the visible process graph.

Hover any activity from the list to see the connection highlighted in your process graph:



You can directly apply a **Selection** with this connection.

Case go to

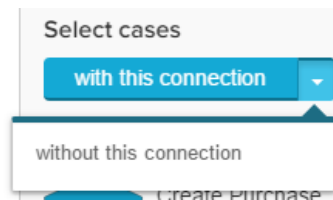
The **Cases go to** button works like the "Case come from" function. However, "Case go to" focuses on all *subsequent* activities rather than the previous activities.

Connection Details

Select cases

You can apply new Selections to get a deeper understanding of this connection using **with this connection**.

The white arrow on the right side will open a drop-down menu, offering the same selection possibilities as already explained above.



This connection



The "This connection" part shows both activities, that are attached to this connection.

Use the **Inspect activity** button to proceed to the "Activity Details" (which are described on the left) for the first or the last activity.

Tools

In the upper left corner of your process map, you can find three symbols.

These are tools to advance and facilitate your process analysis.

The following tools are available:



KPIs

With the KPIs, you can change the displayed numbers next to the activities and connections.

[Click here](#) to learn more about the Process Explorer KPIs.

Animation

Animate your process graph!

[Click here](#) to learn more about Animation.

Inline Activity Chooser

Create a [Selection](#) with selected Activities.

[Click here](#) to learn more about the Inline Activity Chooser.

Happy Path

You might wonder which Process you are shown initially. The initially shown Process is called the [Happy Path](#).

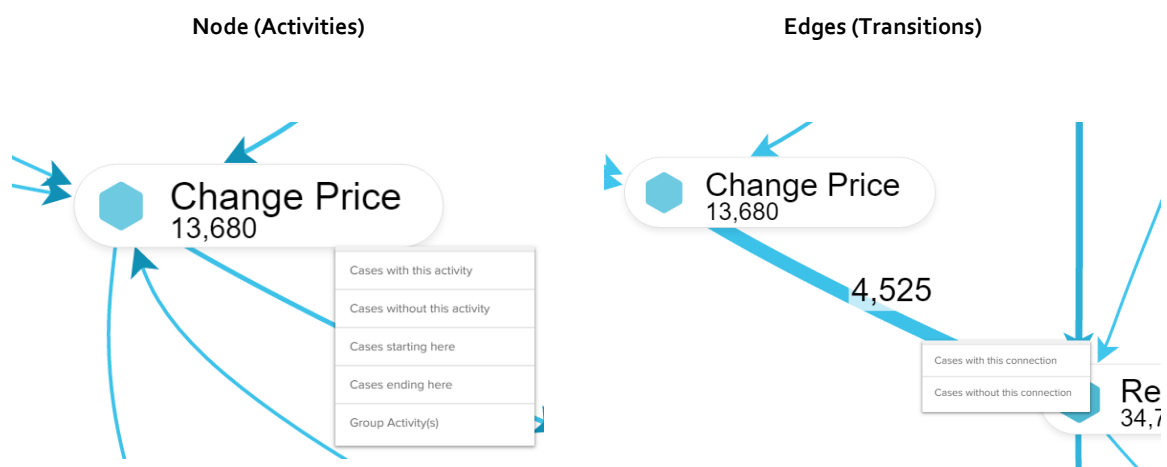
The Happy Path shows the most frequent starting activity, the most frequent ending activity and the most frequent process variant which connects those two activities.

3.3.1 PE: SELECTIONS

You can apply a new [Selection](#) within the Process Explorer!

Choose any edge or node you wish to filter for, and right-click on it.

The following options are available:



▼ Cases with this activity

Creates a [selection](#) including all cases, that pass the selected activity.

▼ Cases without this activity

Creates a [selection](#) excluding this activity (all other cases that do not pass this activity will be selected).

▼ Cases starting here

Selects all cases who start with this activity.

▼ Cases ending here

Selects all cases who end with this activity.

▼ Group Activities


You can group activities to be displayed as a single activity. This will however not create a Selection as the options above.

Let's assume, we want to group the activities "Print and Send Purchase Order (Paper)", "Send Purchase Order (eOrder)", "Send Purchase Order (eMail)" and "Send Purchase Order Update".

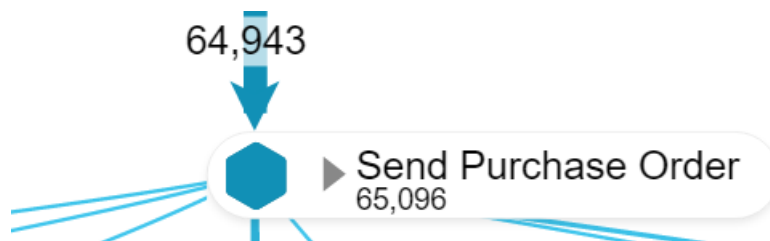
Click on any of these activities, and select "Group Activities". The following window will open:


Select all activities, and (optionally) name your group. The name will be displayed in the Selection Bar and in the Process Explorer.

Search Field: Use the Search Field to search for any activity.


Confirm your selection with .

The new group will now combine all incoming cases.



Recognize a group: You can recognize a group by the small  icon next to the group name.

To edit/ungroup the created group, right-click on the group and select **"Edit Group"** to add/remove activities from this group or **"Ungroup"** to delete this group.

With **"Expand Group"** you will temporarily dissolve the group. All included activities will show up in the Process Map again, with a small  icon attached. Right-click on any of these activities and choose **"Collapse Group"** to resolve the group.

Group selections

You can apply all options above not only to activities but even to grouped activities. With the group that we created in this example, we could select all cases, that end with "Send Purchase Order" (and did not end with a successful delivery).

▼ Cases with this connection

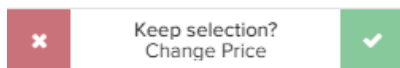
Creates a [Selection](#) with all cases that pass this edge. All other cases will be removed from your Selection.

▼ Cases without this connection

Creates a [Selection](#) with all cases that *do not* pass this edge. All cases that pass this connection will be removed from your Selection.

To activate your new selection, you have to activate it in the **Selection Bar**.

The following section will appear next to your active selections:



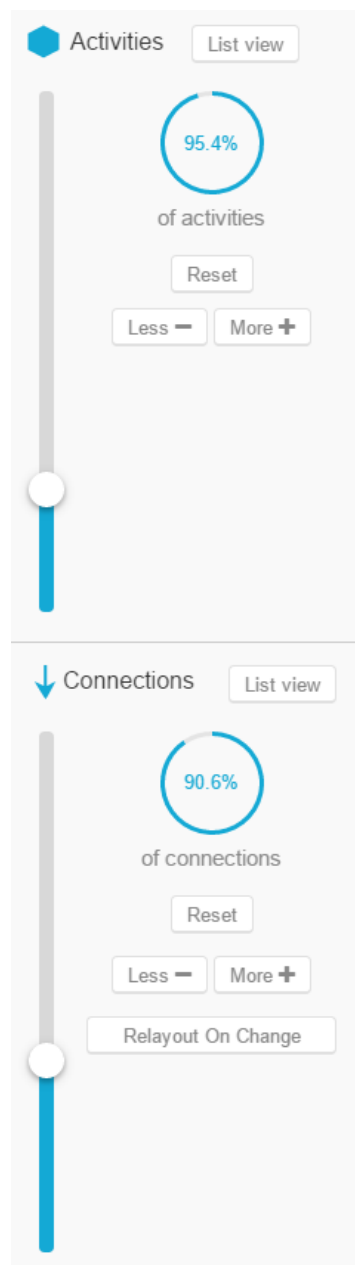
You can either activate your new Selection or reset the Selection.

To learn more about Selections, please refer to the [Selections](#) chapter.

3.3.2 COVERAGE

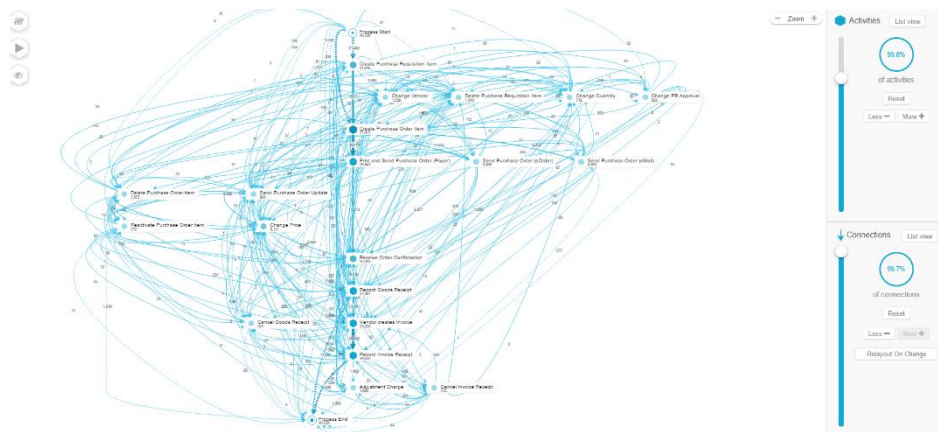
At the right side of the Process Explorer, you will find the coverage bars that allows you to change the coverage of the **Activities** and the **Connections** used within your process model.

At a very low coverage level, the process model will only show the most common process variants.



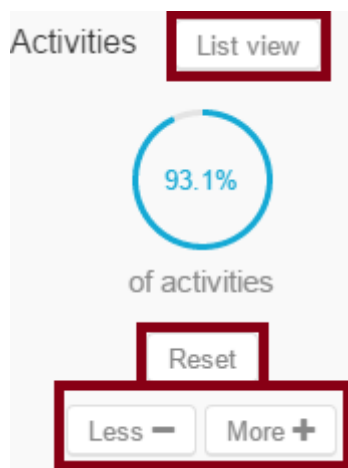
The higher the coverage, the more variants will be included in the process model.

On the next screenshot, you can see Process Model that consists of *all* activities and connections in this process is shown.



You can set a coverage rate for both the number of activities and the connections between these activities. More coverage allows a deeper insight up to 100 % transparency.

The following options are available to facilitate the interaction with the coverage:



▼ Less / More

Increases or decreases the number of visible activities/connections by 1 per click.

▼ Reset

Resets the coverage to the initial value. The initial values are calculated using the most frequented process path.

▼ List view

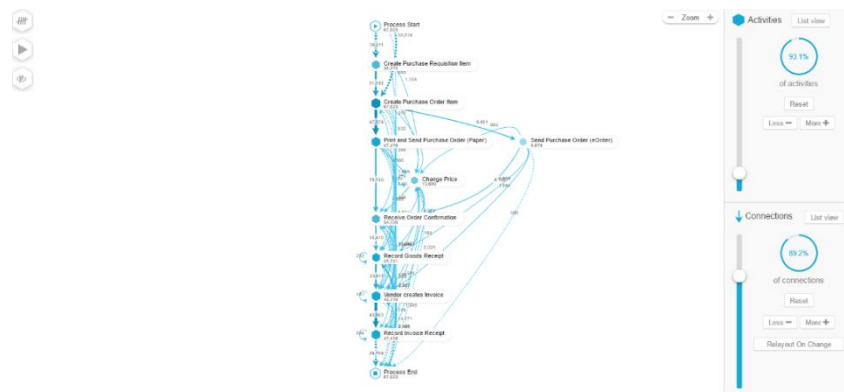
If you want to choose your own Activities or Connections, you can activate the "List view". This will show a list of all activities or all connections to choose from. This option might be useful if you want to see a specific activity/ connection that is not frequented very often and wouldn't appear in the regular coverage until your coverage reaches a high level (decreasing clarity).

Connections offer another option:

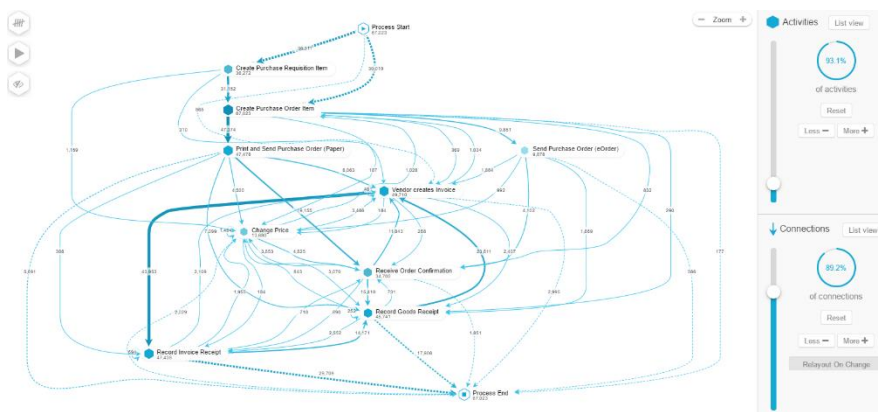
▼ Relayout On Change (Connections)

Connections decrease the clarity of the process map. If you increase the number of connections, you can activate the "Relayout On Change" option by clicking on **Relayout On Change**. This will stretch your process graph to the best fit into the process map:

No relayout



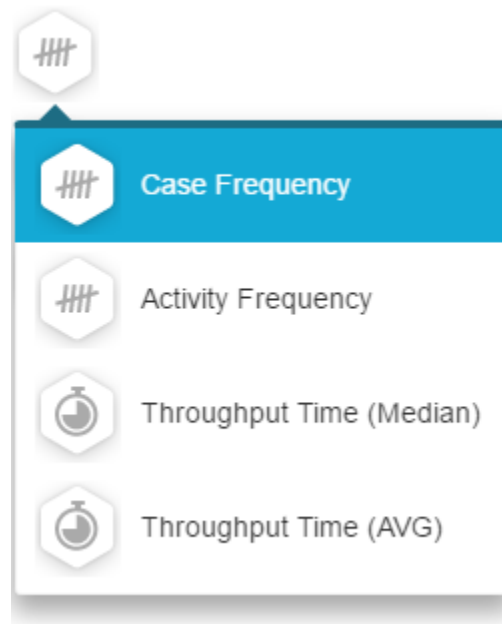
Relayout



3.3.3 PE: KPIS

Process Explorer KPIs are values calculated based on formulas to display the Case Frequency, the Activity Frequency and the Throughput Time.

Click on the KPI icon in the upper left part of your process map, to open the available options:



By default, the "Case Frequency" is selected.

▼ Case Frequency

The Case Frequency displays the **number of cases**, that pass a certain activity or a connection between two activities. This is the default option.



▼ Activity Frequency

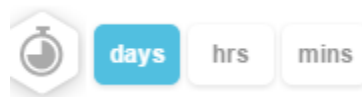
One case can pass a certain activity never, once or several times. Let's assume, that several price changes occur in several cases in a Purchase-To-Pay process. Whereas the Case Frequency simply counts the number, that this activity is "hit" by any case, the Activity Frequency counts the distinct cases that pass this activity. The Activity Frequency will thus always be equal or smaller than the Case Frequency.

(The Activity Frequency is adopted by connections accordingly).

▼ Throughput Time

The Throughput Time KPI calculates the time it needs for cases to proceed from activity A to activity B. You can choose between the Median or the Average (AVG) measure.

As you activate a Throughput Time KPI, the KPI symbol will change from  to . Hover this button to see the available **time units**:



You can choose between days, hours (hrs) and minutes (mins).

Custom KPIs

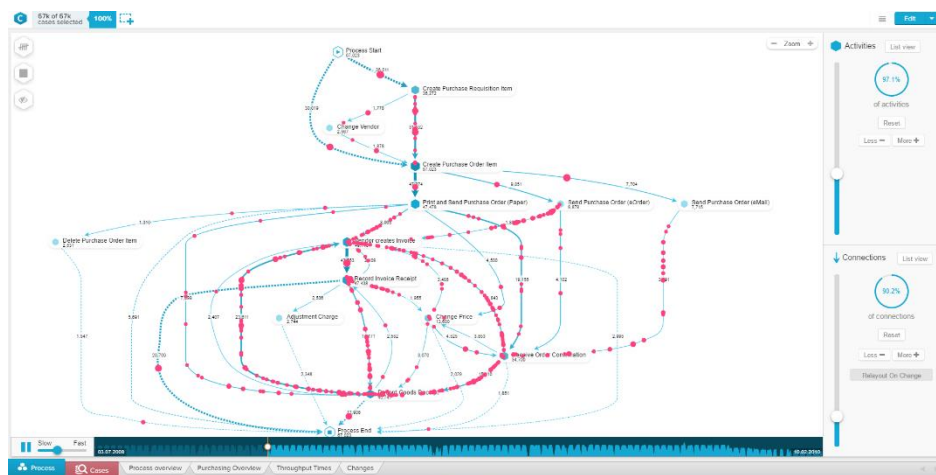
You might see more KPIs in this dropdown menu, that have not been described here. There are [Custom KPIs](#) and have to be configured by an [Analyst](#).

3.3.4 ANIMATION



You can animate your process in the Process Explorer by clicking .

Your cases will be represented by colored circles of different sizes. They are scaled according to the number of aggregated cases. Their speed is dependent on their throughput time.




You can control the speed and the time at which the animation is playing with the following controls at the bottom:

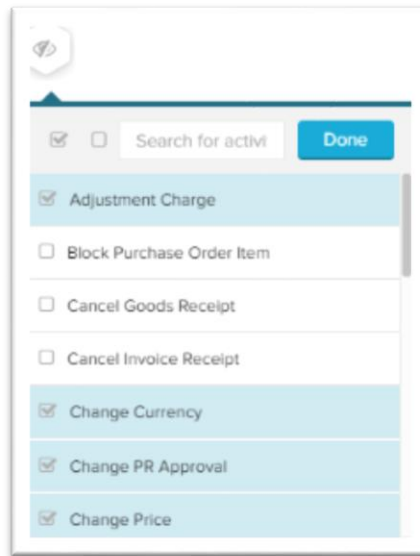


The animation can be stopped by clicking at the top left in your process map.

3.3.5 INLINE ACTIVITY CHOOSER

The Inline Activity Chooser allows you to show and hide activities within the Process explorer.

Click on the  icon to open a drop-down menu, listing all available activities:



Choose the activities that you wish to display in your process graph. All deselected activities will be hidden in the graph.


As a help, you can use the **search field** or the small icons next to the field, to find and select your cases:



will select *all* available cases.



will deselect all selected cases.

Don't forget to confirm with .

3.4 CASE (EXPLORER)

The Case Explorer is an intuitive tool for examining single cases and their associated activities.

The data provided will be presented as a table:

CASEID	NUMBER OF ACTIVITIES	DURATION	_CASE_KEY	CLIENT	PURCHASING DOCUMENT	ITEM	DELETION INDICATOR	RFG STATUS	LAST CHANGED ON	SHORT TEXT	MATERIAL
234156	6	1M	234156	800	0000234156	70020	--	--	2008-10-11 22:00:00	Fluoreszenz L 8 50 P	E-02910
23416	8	1M	23416	800	000003416	00010	--	--	2008-02-27 23:00:00	IT Markt 0500	--
234160	6	1M	234160	800	0000234160	70010	--	--	2008-10-11 22:00:00	Fluoreszenz L 8 50 P	M-01270
234172	6	17S	234172	800	0000234172	70020	--	--	2008-10-11 22:00:00	Zurückgabe 3000	1306-81
234176	3	1M	234176	800	0000234176	70020	--	--	2008-10-11 22:00:00	Pyridin CDC 50%	500-130
234180	6	1M	234180	800	0000234180	70060	--	--	2008-10-11 22:00:00	Diamino-Toluene 50%	500-170
234184	6	1M	234184	800	0000234184	70100	--	--	2008-10-11 22:00:00	Cyanuric Chloride 5...	500-210
234188	5	3S	234188	800	0000234188	70010	--	--	2008-10-11 22:00:00	Neugon head sch...	99-120
234192	5	10S	234192	800	0000234192	70010	--	--	2008-10-11 22:00:00	Rohverlegeteile...	--
234195	1	1S	234195	800	0000234195	70040	--	--	2008-10-11 22:00:00	Palette 110 x 110 x...	PK-095
23420	8	1M	23420	800	000023420	00010	--	--	2008-02-27 23:00:00	Oranges	CPK301
234200	1	1S	234200	800	0000234200	70080	--	--	2008-10-11 22:00:00	Palette 110 x 110 x...	PK-095
234204	1	1S	234204	800	0000234204	70010	--	--	2008-10-11 22:00:00	Desktop Standard	CPK200
234208	1	1S	234208	800	0000234208	70050	--	--	2008-10-11 22:00:00	HSC-Controller Emu...	CPK200
234212	1	1S	234212	800	0000234212	70090	--	--	2008-10-11 22:00:00	Motherboard Penti...	C-1112
234216	1	1S	234216	800	0000234216	70130	--	--	2008-10-11 22:00:00	StM-Modul 32 MB	CPK301
234220	1	1S	234220	800	0000234220	70010	--	--	2008-10-11 22:00:00	Rohverlegeteile...	--
234224	1	1S	234224	800	0000234224	70010	--	--	2008-10-11 22:00:00	Pipeline	--
234228	7	15S	234228	800	0000234228	70010	--	--	2008-10-11 22:00:00	Pipeline	--
234232	4	2M	234232	800	0000234232	70010	--	--	2008-10-11 22:00:00	Hochwelle (bleigen...	T-CONT
234236	4	2M	234236	800	0000234236	70030	--	--	2008-10-11 22:00:00	Hydrochloric Acid S...	500-140
23424	6	1M	23424	800	0000023424	00010	--	--	2008-02-27 23:00:00	Cinnamon	CPK301
234240	4	2M	234240	800	0000234240	70070	--	--	2008-10-11 22:00:00	Sodium Nitrate 50%	500-180
234244	4	2M	234244	800	0000234244	70110	--	--	2008-10-11 22:00:00	Natriumcarbonat 90%	500-220
234248	4	2M	234248	800	0000234248	70010	--	--	2008-10-13 22:00:00	Flüssiges Weizen P...	CPK201
234252	4	2M	234252	800	0000234252	70020	--	--	2008-10-13 22:00:00	Cordless Clock Opt...	CPK201
234256	1	1S	234256	800	0000234256	70010	--	--	2008-10-12 22:00:00	Raw Material 101 (...	DK-101
234260	3	1M	234260	800	0000234260	70020	--	--	2008-10-11 22:00:00	KANBAN Item 2 - P...	LSB-KBS
234264	2	10S	234264	800	0000234264	70030	--	--	2008-10-11 22:00:00	19" Monitor 21"	3007-03
234272	3	1M	234272	800	0000234272	70010	--	--	2008-10-11 22:00:00	Alter Industriemasg...	P180_V0
234276	3	1M	234276	800	0000234276	70030	--	--	2008-10-11 22:00:00	Connector 24	VIPK1_U
23428	8	1M	23428	800	000003428	00010	--	--	2008-02-27 23:00:00	Label Canned Fruit	CPK-011

Order columns:

As the Case Explorer usually displays a lot of cases, you might want to start ordering the columns, to obtain relevant information at a glance.

Simply Drag & Drop the columns with your mouse.

Search

To search for data in a specific column, hover the column title. A lens icon will show up next to the column title:



Click the lens to open a search field.



Enter your search and press Enter on your keyboard.

Now the whole table will only show cases that include your search value in your selected column.

You can even apply different searches on various columns!

Just repeat these instructions for any other column.

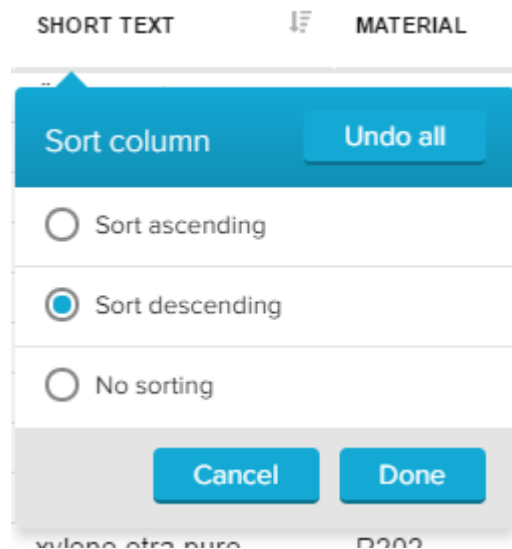
All columns that are affected by a search will be marked with a blue lens:



To alter or delete your search, click on the lens. The search field will open again.

Sorting

To sort one or several columns, left-click on any column title. A sorting field will come up:




You can choose between a descending sorting rule or an ascending sorting rule.

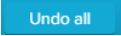
By default, every column is set to "No sorting" (and will thus be sorted by the Case ID column).

Sorting in Data Models:

Your Data Model might already include sorting rules for the Case Table. These can be pre-defined in the Data Integration process (learn more about Data Integration in the [Data Scientist](#) chapter).

You can recognize active sorting rules by a small  symbol. You can alter or remove your sorting rule by clicking on this icon.

Undo all sorting rules:

To undo all existing sorting rules (among all columns), select .

3.4.1 CASE DETAILS








The **Case Details** show all activities, that are passed by this case, in the right order.

Choose any case from the table, to see its details on the right side:

CASE ID	NUMBER OF ACTIVITIES	DURATION	CASE KEY	CLIENT	PURCHASING DOCUMENT	ITEM	DELETION INDICATOR	RFQ STATUS
233436	4	1M	233436	800	0000233436	70010	--	--
23344	6	1M	23344	800	000023344	00030	--	--
233440	4	1M	233440	800	0000233440	70010	--	--
233444	4	2M	233444	800	0000233444	70010	--	--
233448	4	1M	233448	800	0000233448	70010	--	--
233452	4	1M	233452	800	0000233452	70010	--	--
233456	6	4d	233456	800	0000233456	70010	--	--
233460	5	18d	233460	800	0000233460	70010	--	--
233464	8	5d	233464	800	0000233464	70010	--	--
233468	7	22d	233468	800	0000233468	70010	--	--
233472	6	2M	233472	800	0000233472	70010	--	--
233476	7	1M	233476	800	0000233476	70010	--	--
23348	4	2d	23348	800	000023348	00010	--	--
233480	5	3M	233480	800	0000233480	70010	--	--
233484	5	1M	233484	800	0000233484	70010	--	--
233488	5	18d	233488	800	0000233488	70010	--	--
233492	2	5d	233492	800	0000233492	70010	--	--
233496	6	4M	233496	800	0000233496	70010	--	--
233500	4	1d	233500	800	0000233500	70010	--	--
233504	5	4M	233504	800	0000233504	70010	--	--
233508	5	4M	233508	800	0000233508	70010	--	--
233512	7	24d	233512	800	0000233512	70010	--	--
233516	3	12d	233516	800	0000233516	70010	--	--
23352	11	8M	23352	800	000023352	00010	--	--
233520	6	1M	233520	800	0000233520	70010	--	--
233524	7	18d	233524	800	0000233524	70010	--	--
233528	7	7d	233528	800	0000233528	70010	--	--
233532	9	7d	233532	800	0000233532	70010	--	--
233536	6	6d	233536	800	0000233536	70010	--	--
233540	2	5d	233540	800	0000233540	70010	--	--
233544	7	4d	233544	800	0000233544	70010	--	--
233548	7	1M	233548	800	0000233548	70010	--	--
233552	-	-	233552	800	0000233552	70010	--	--

CASE DETAILS	
name, date, column value	Q
Create Purchase Requisition Item ▶	0
Thu, Oct 8, 2009 12:00 AM	
Create Purchase Order Item ▶	+1d
Fri, Oct 9, 2009 7:40 AM	
Print and Send Purchase Order (P...	+1d
Fri, Oct 9, 2009 7:40 AM	
Receive Order Confirmation ▶	+4d
Mon, Oct 12, 2009 11:29 AM	
Record Goods Receipt ▶	+21d
Thu, Oct 29, 2009 10:28 AM	
Vendor creates Invoice ▶	+22d
Fri, Oct 30, 2009 12:00 AM	
Record Invoice Receipt ▶	+22d
Fri, Oct 30, 2009 10:05 AM	








Let's examine the Case Details a little more closely:

CASE DETAILS		×
name, date, column value		Q
 Create Purchase Requisition Item ▶ Thu, Oct 8, 2009 12:00 AM	0	
 Create Purchase Order Item ▶ Fri, Oct 9, 2009 7:40 AM	+1d	
 Print and Send Purchase Order (P... Fri, Oct 9, 2009 7:40 AM	+1d	
 Receive Order Confirmation ▶ Mon, Oct 12, 2009 11:29 AM	+4d	
 Record Goods Receipt ▶ Thu, Oct 29, 2009 10:28 AM	+21d	
 Vendor creates Invoice ▶ Fri, Oct 30, 2009 12:00 AM	+22d	
 Record Invoice Receipt ▶ Fri, Oct 30, 2009 10:05 AM	+22d	

Next to each activity, we can see the cumulated duration of this case, as it passes the connections between different activities (throughput time).

Furthermore, you see a timestamp for each activity.


Click on any activity to see its details:

CASE DETAILS		
name, date, column value		
	Create Purchase Requisition Item ▶ Thu, Oct 8, 2009 12:00 AM	-4d
	Create Purchase Order Item ▶ Fri, Oct 9, 2009 7:40 AM	-3d
	Print and Send Purchase Order (P... Fri, Oct 9, 2009 7:40 AM	-3d
	Receive Order Confirmation ▶ Mon, Oct 12, 2009 11:29 AM	0
<hr/>		
_CASE_KEY	233468	
_SORTING	28	
USER_TYPE	A	
ACTIVITY_DE		
CHANGED_TABLE		
CHANGED_FIELD		
CHANGED_FROM		
CHANGED_TO		
CHANGE_NUMBER		
TRANSACTION_CODE		
CHANGED_FROM_FLOAT		
CHANGED_TO_FLOAT		
	Record Goods Receipt ▶ Thu, Oct 29, 2009 10:28 AM	+17d
	Vendor creates Invoice ▶ Fri, Oct 30, 2009 12:00 AM	+18d
	Record Invoice Receipt ▶ Fri, Oct 30, 2009 10:05 AM	+18d

As soon as we select any activity from the Case Details, the reference time is set to 0 for this activity.

In this example, this allows us to examine the time it takes for a Purchase to have its invoice receipt recorded, starting at the time the order has been confirmed.

Furthermore, you can see details taken from the Activity Table (please refer to the [Data Scientist](#) chapter).

With  you can apply a [Selection](#) to your selected case.

3.5 SELECTIONS

One of the most powerful functions of SAP Process Mining by Celonis 4.2 is **dynamic filtering**.

This allows the user to create selections from any component of an Analysis Sheet, affecting the whole Analysis Document.

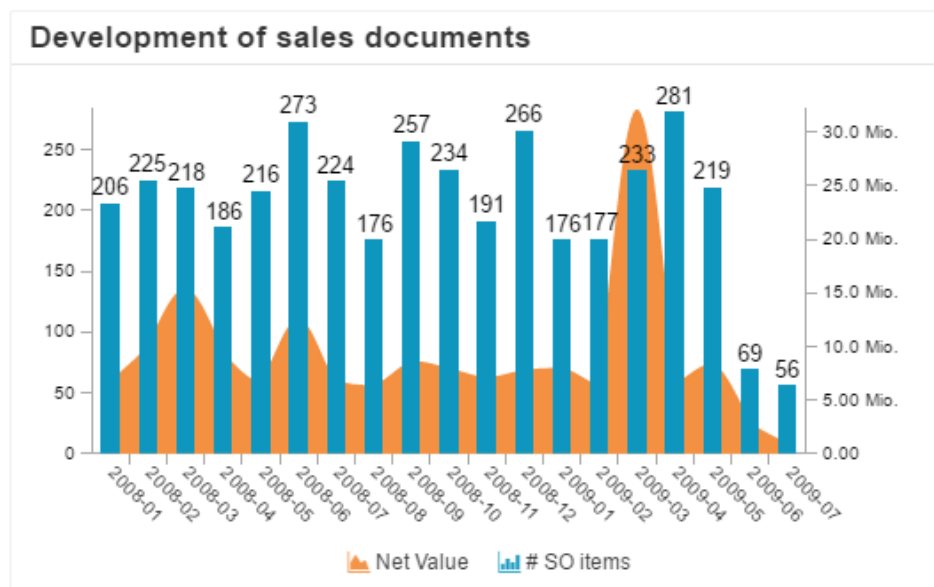
Only cases that meet your filter criteria are examined in the components, as long as the selection is active.

Create a Selection

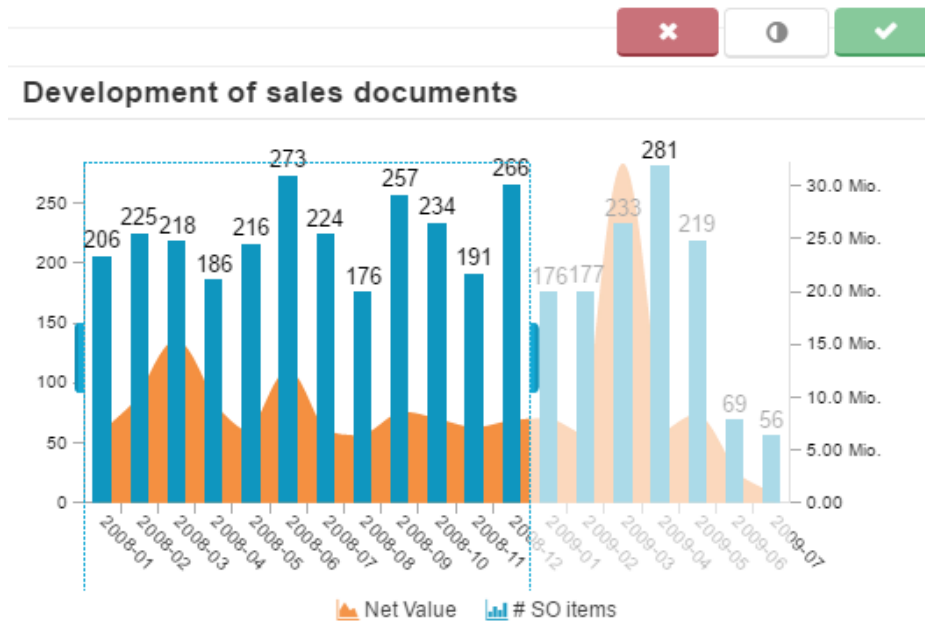
1 - Define the cases, that you wish to select for

Let's assume, we want to select all Sales from 2008 (01.2008 - 12.2008) from an Order-to-cash process.

2 - Use your mouse to select the selection area from any component



Here we have a column chart that shows the course of our Sale-Items and the Net Value over months between 01.2008 and 07.2009.



With Drag & Drop we can draw an area over any component, and adjust it afterwards.

Now we need to select all cases that occurred between 01.2008 and 12.2008.

3 - Confirm your selection

After defining the area in our component, we do now need to confirm this selection, before it is applied to the Analysis Document.

In the upper right corner of your component, you will find the following icons:



This will confirm the selection.

This would apply the selection with the selected cases (Sales in 2008).



This will apply an inverted selection. All cases that have *not* been covered by the above selection, will be selected. No further confirmation is required.

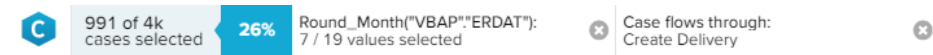
This would apply a selection of all cases (Sales) that did not happen in 2008.




This deletes the selection.

After a selection has been applied, it is active. The whole Analysis Document (including the [Process Explorer](#) and the [Case Explorer](#)) will now only focus on cases that meet the Selection criteria (if the component has not been manually escaped from selections by the settings of the [Analyst](#)).

All active selections are listed in the [Selection Bar](#).




Delete a selection

To delete a selection, use the small  that can be found next to all selection names. This will deactivate and remove the selection from the Analysis Document.

The components will refresh themselves automatically, and adopt the new selection criteria.

Reset selections

If you want to delete all selections that you made (and return to the initial state of your Analysis sheet), you can click on  in the top right corner of your selection bar.

3.5.1 SELECTION BOOKMARKS

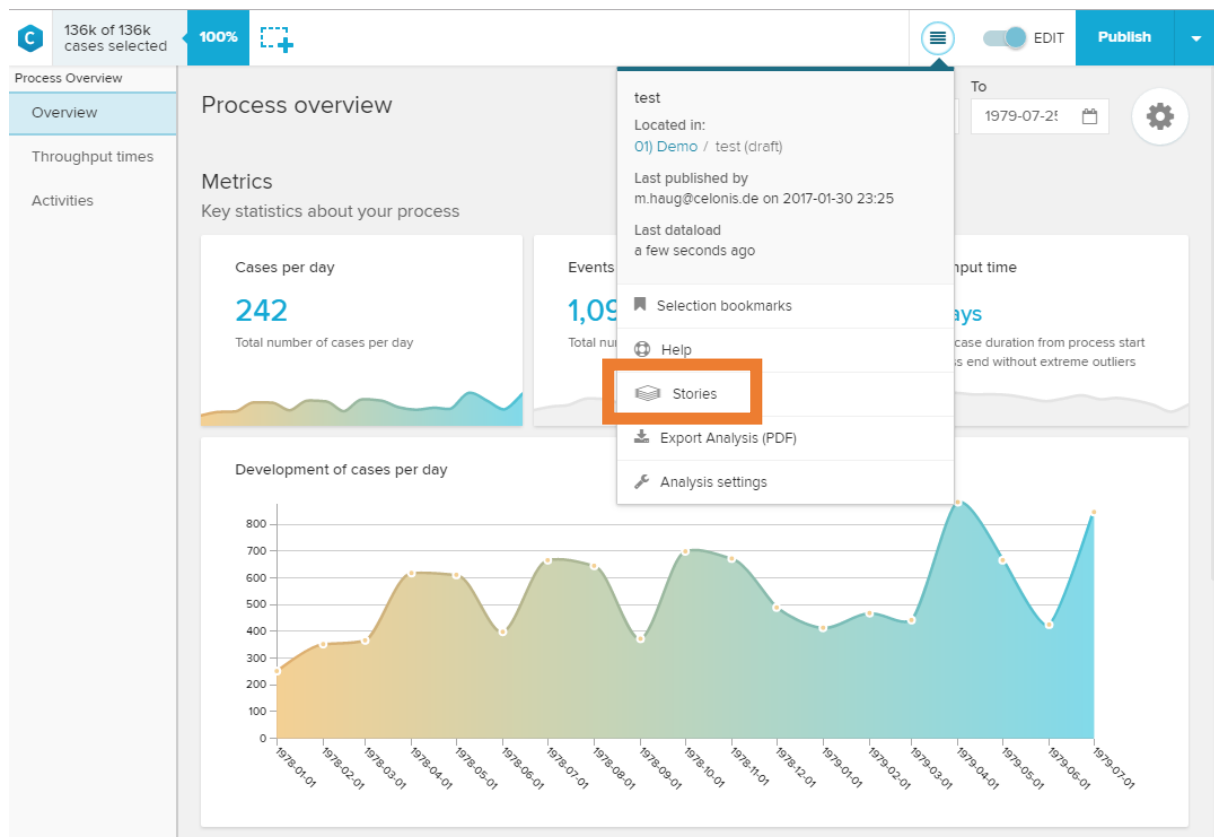
Selection Bookmarks store the current state of an analysis. They can be used to save findings and re-use them at a later point in time.

For details see: 4.6.6.

3.6 STORIES

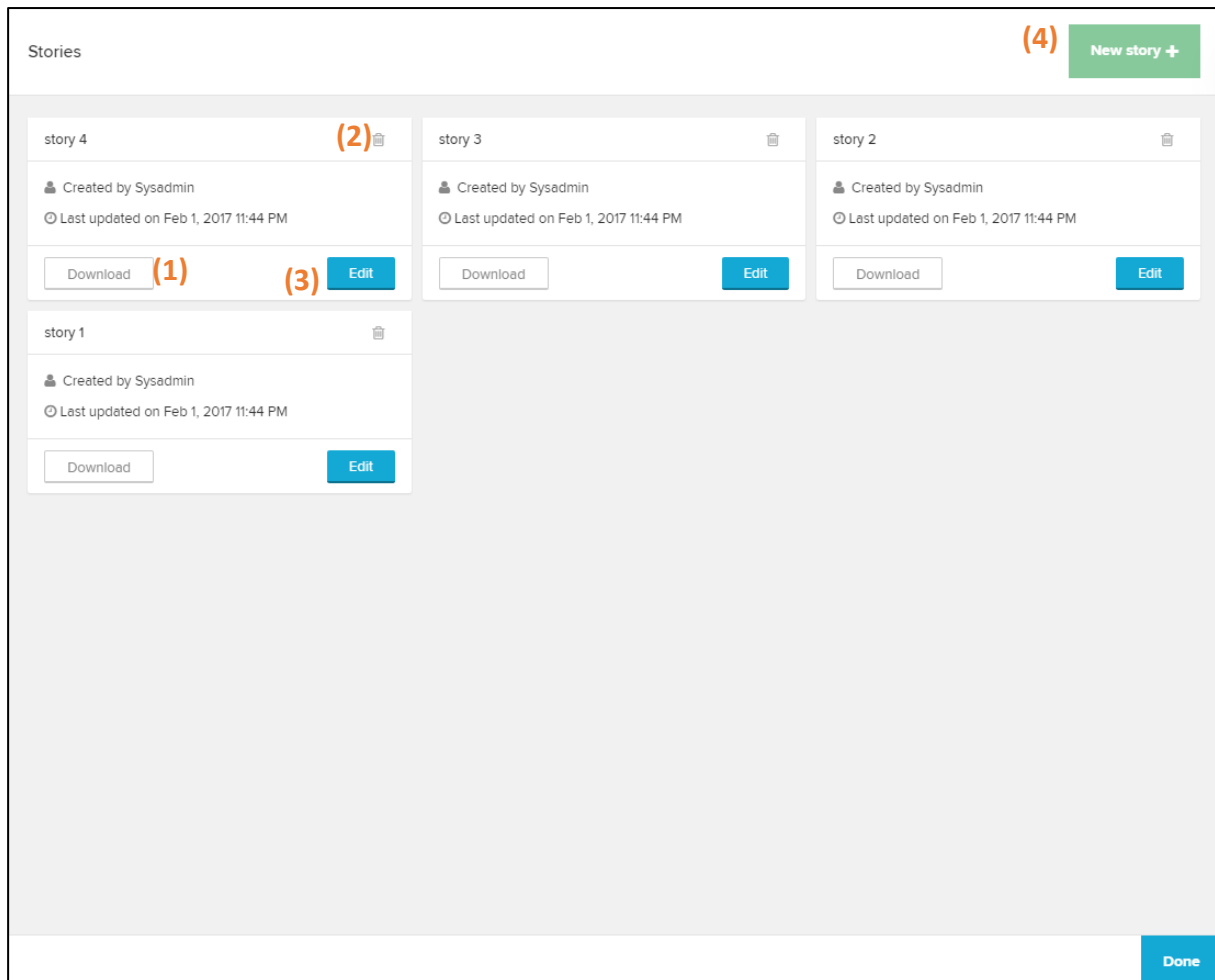
Stories allow you to collect your insights generated with SAP Process Mining by Celonis 4.2 and share them with your colleagues and employees. Process Mining Stories capture the insights you generate with Analyses, can be downloaded as PDFs or scheduled to be sent via mail.

The stories can be found within every analysis in the burger icon at the top right:



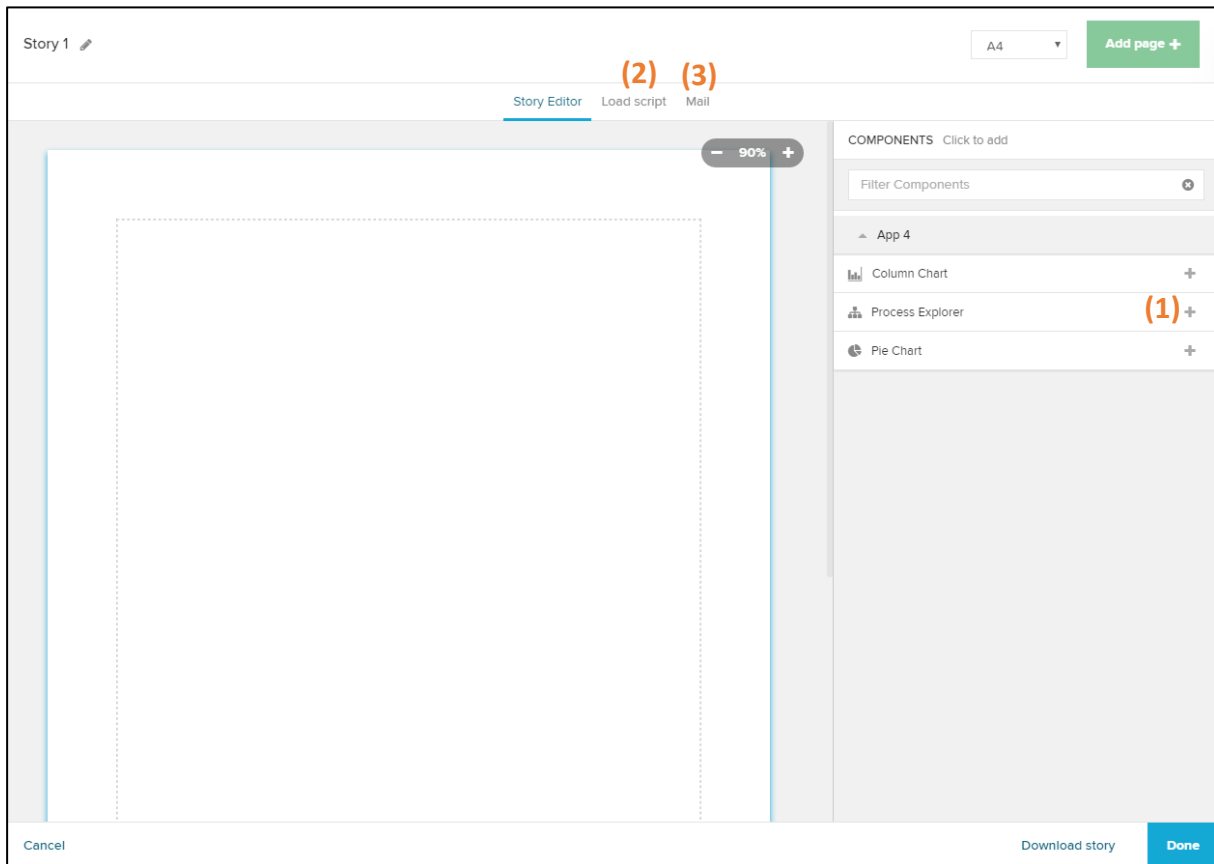
3.6.1 CREATE STORIES

The main section of the stories UI shows you all existing stories in separate tiles. These stories can be directly downloaded (1), deleted (2) or edited (3). To create a new story from scratch, click on the button at the top right (4).



3.6.2 CONFIGURE STORIES

Any component that is in the analyses can be added to the story. To add a component, click on the plus icon (1) next to the component in the component list on the very right. The newly added components will be added to the top right of the currently selected sheet. The components can easily be rearranged and resized to the desired format.



At the top of the story's edit section you can also switch to the load script (2) and mail configuration (3). The load script defines which parts of the data will be displayed in the components of the story

Note: All components in a story do not respect the component load scripts in the analysis. Only the story's own load script will be respected for the downloaded PDF.

It is possible to send schedule mails, which distribute the Process Mining Stories as attached PDFs. The mails will be sent according to the schedule which is defined, will contain the specified subject and text and sent to the added mail addresses. The sender which will be visible to the recipients is the user who creates the story.

4 ANALYST

In this chapter, you want to learn how to create and configure your own analyses.

It explains all available components in detail, covers advanced selections, styling issues and user permissions.

Understanding this chapter will qualify you to plan, create and configure your own analysis documents based on an existing Data Model and to share this analysis with various user.

Edit-Rights:

Please make sure to have Edit-Rights on the Analysis that you want to manage.

To create your own Analysis Documents in an existing project, you need to have "Create" - Rights for this project.

To create a new Project however, you need to have "Global Content" administrative rights.

[Click here](#), to get more information on object permission within an existing project.

[Click here](#), to learn more about the Global Content Administrator.

For any questions regarding your SAP Process Mining by Celonis 4.2 permissions, please contact your User Administrator.

Last but not least, we would like to reference to our [PQL-Tutorial](#). You might need PQL to create your own KPIs and configure your components.

What's Inside?



Manage Analysis

Manage Selections

Components

Dimensions & KPIs

Permissions

Analysis Settings

Bookmarks

Let's start with taking an in-depth look at analysis documents. Proceed here: [Manage Analysis](#)

4.1 MANAGE ANALYSIS

In SAP Process Mining by Celonis 4.2, process analysis is structured in projects, each of them can contain an endless number of Analysis Documents.

You should be familiar with the [Basic Structure](#) of the SAP Process Mining by Celonis 4.2 software.

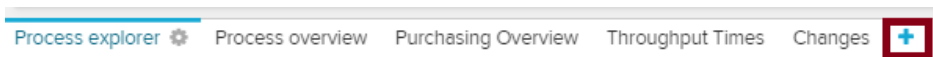
Furthermore, we recommend to read the [Analysis Document](#) chapter, to understand the navigation.




We already know, that every analysis document is made of (at least one) analysis sheets, which can be accessed through the Tab - Bar (see [Analysis Document](#)).

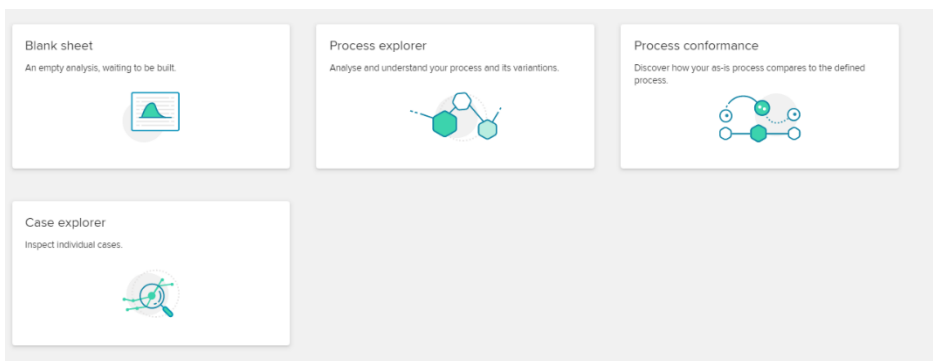
Create a new sheet

With Edit-Rights, your Tab-Bar will be extended by a blue "New-Sheet" icon:



Click on  to create a new Analysis Sheet.

You can now choose between the following sheet templates:



▼ Blank Sheet

A blank sheet provides an empty analysis sheet, without any components.
You can build your desired analysis from scratch, with all available [components](#).

▼ Process explorer

This will create a sheet containing a [Process Explorer](#).
Please note however, that no further components can be added to this sheet.

▼ Case explorer

This will create a sheet containing a [Case Explorer](#).
Please note, that no further components can be added to this sheet.

▼ Process conformance

This will create a sheet containing a [PI Conformance](#) template.
Please note, that no further components can be added to this sheet.

4.1.1 EDIT-MODE

To edit any Analysis sheet, you need to **turn on edit mode**.

The edit mode trigger can be found in the upper right part of every analysis sheet:

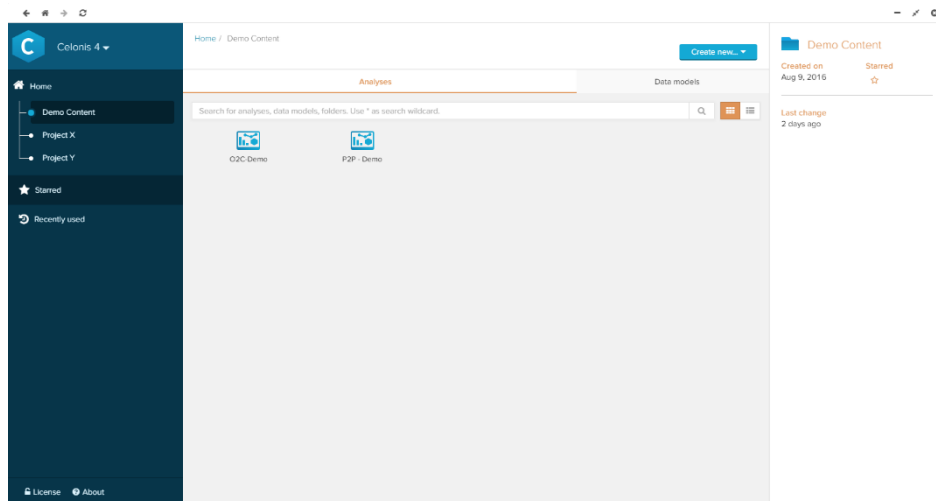


If you turned on edit mode, a blue grid will be set as background for your analysis sheet. In Edit-mode it is possible to rearrange and resize [Components](#).

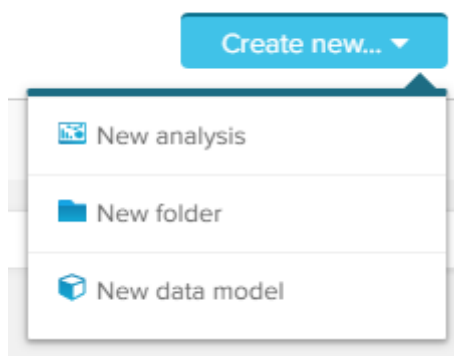
4.1.2 NEW ANALYSIS

To create your own analysis, you must go back to your [Home screen](#).

Open the project to create an analysis document in this project.



Provided that you have sufficient rights to create new analysis objects, a blue "Create New" button will appear in your toolbar. Click this button to open a drop-down menu:




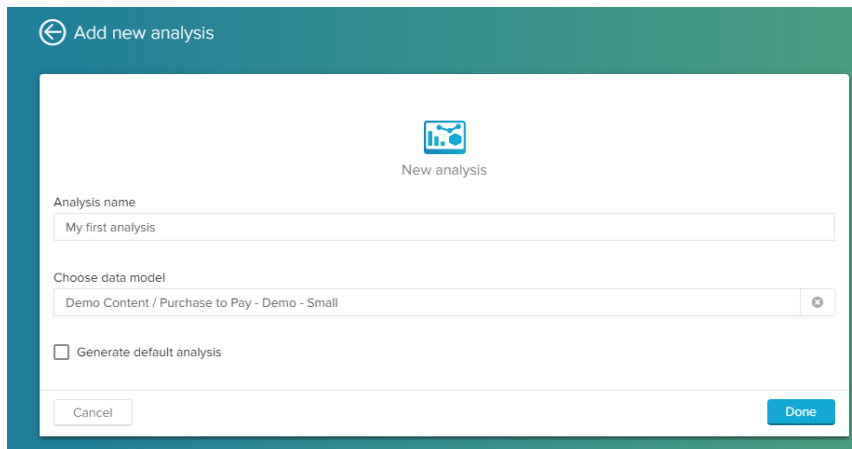
Please Note

Enterprise-Server Edition:

You might have granted sufficient rights to create a new analysis document but might not be allowed to create a new data model.

For this reason, the content of this drop-down menu might display less entries.

Click on  **New analysis** to create a new analysis document.



Please enter a name for your new analysis, and choose a data model from the list ("Choose data model").

No Data Model?

If no data model has been created yet, [start creating one](#) or contact your content administrator.

Please note, that data models can only be used within the same project!

For more information, please refer to the [Structure](#) chapter.

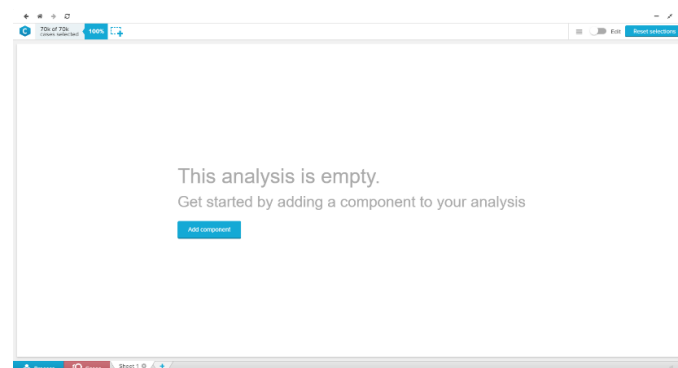
Generate default analysis

If this option is available, SAP Process Mining by Celonis 4.2 4 can create default analysis sheets with various [Components](#) that most likely fit your data model. This will facilitate your first moves as an Analyst, as you can check out the configuration of existing components prior to creating your own.

You can of course extend or reduce the default analysis components to match it to your requirements.

Click on  to proceed.

In the next step, you will be redirected to your new analysis. If you did not generate default analysis, your analysis will be empty:




Turn on [Edit-Mode](#) and start adding [components](#).

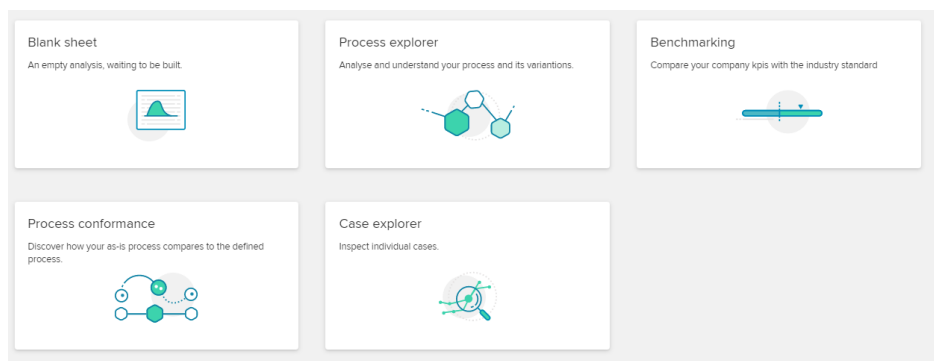
4.1.3 SHEETS

Analysis Documents consist of at least one analysis sheet (however, there is no maximum number of allowed analysis sheets).

Please consider the [Structure](#) chapter for more information on the relation between analysis documents, analysis sheets and data models.

To add a new sheet, turn on [Edit-Mode](#) and click on the small  icon in the sheet bar.

This will offer you with the following sheet layouts. Choose one to proceed.



If you want to create your analysis from scratch, using all available [Components](#), choose **Blank sheet**.

To dedicate a whole sheet to a [process explorer](#), choose **Process explorer**.

To place a [case explorer](#) on a sheet, choose **Case explorer**.

To relate your process to a pre-defined process, choose [Process conformance](#).

4.2 MANAGE SELECTIONS

Please Note


This chapter explains advanced selection methods.

You should already be familiar with the basic functionality of Selections.

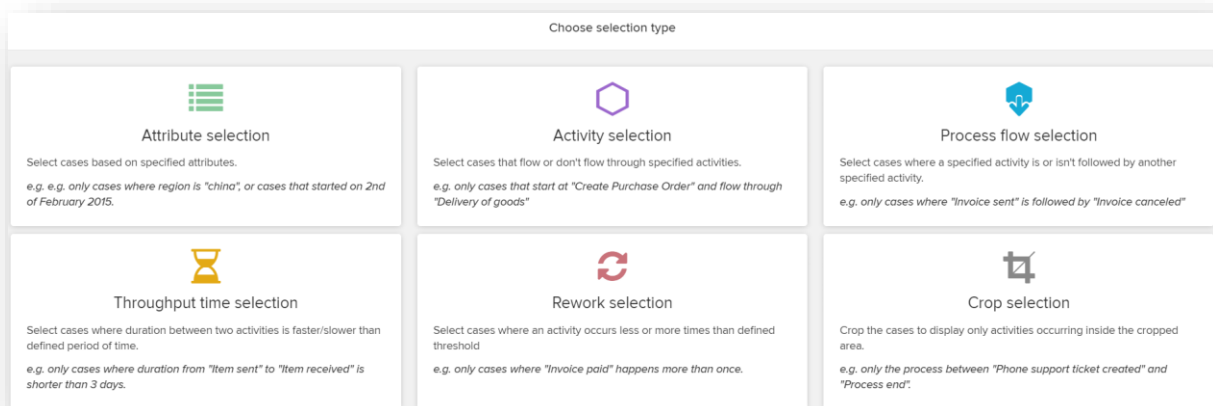
[Click here, to read the Introduction of Selections.](#)

You will need Edit-Rights for this Analysis Document, however, the [Edit-Mode](#) does not have to be active.

Selection UI

The Selection UI is a graphical User-Interface. You can open it in the Selection bar with this icon: .

A window will open, offering you the following selections:



(Click on any selection to learn more).

The selections are meant to be predefined by analysts and used by viewers.

4.2.1 ATTRIBUTE SELECTION



With the Attribute Selection, you can apply a selection that selects cases based on specific attributes.

The screenshot shows the "Attribute selection" interface. At the top, it indicates "279k of 279k cases selected" and "100%". Below this, the "Attribute selection" title is followed by a "New selection" button. The interface is divided into two main sections: "Table And Column" on the left and "COLUMN VALUES" on the right.

Table And Column: This section contains a search bar and a list of tables and columns. The selected table is "_CEL_P2P_ACTIVITIES". The columns listed include: _CASE_KEY, ACTIVITY_EN, EVENTTIME, _SORTING, User Type, ACTIVITY_DE, CHANGED_TABLE, CHANGED_FIELD, CHANGED_FROM, CHANGED_TO, CHANGED_FROM_FLOAT, CHANGED_TO_FLOAT, CHANGE_NUMBER, Purchasing Document Header, Purchasing Document Item, and Vendor Master (General Section).

COLUMN VALUES: This section displays a list of values for the selected column. The values are: 1000, 10000, 100000, 100001, 100002, 100003, 100004, 100005, 100006, 100007, 100008, 100009, 10001, 100010, 100011, and 100012. The value "100000" is selected, indicated by a checkmark and a blue highlight.

At the bottom right, there is a "Done" button.

To add an attribute, start with choosing a table from the left side.

You will see all columns of this table. Choose a column to see its content in the centre.

Now select a specific value (attribute) from this column. This will be then moved to the top of the column - list.

279k of 279k cases selected 100% _CASE_KEY 100000

Attribute selection

Table And Column

Table, column or dimens

_CEL_P2P_ACTIVITIES

_CASE_KEY

ACTIVITY_EN

EVENTTIME

_SORTING

User Type

ACTIVITY_DE

CHANGED_TABLE

CHANGED_FIELD

CHANGED_FROM

CHANGED_TO

CHANGED_FROM_FLOAT

CHANGED_TO_FLOAT

CHANGE_NUMBER

Purchasing Document Header

Purchasing Document Item

Vendor Master (General Section)

COLUMN VALUES:

Search column value

Block Purchase Order Item

Book Invoice

Cancel Goods Receipt

Change Currency

Change Price

Change Quantity

Create Purchase Order Item

Create Purchase Requisition Item

Delete Purchase Order Item

Dun Order Confirmation

Print and Send Purchase Order

Reactivate Purchase Order Item

Receive Goods

Receive Order Confirmation

Refuse Purchase Order Item

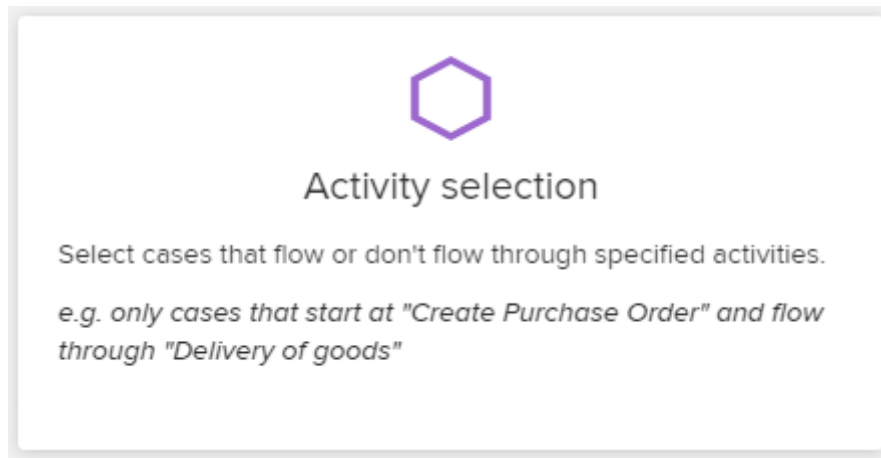
Remove Payment Block

Done

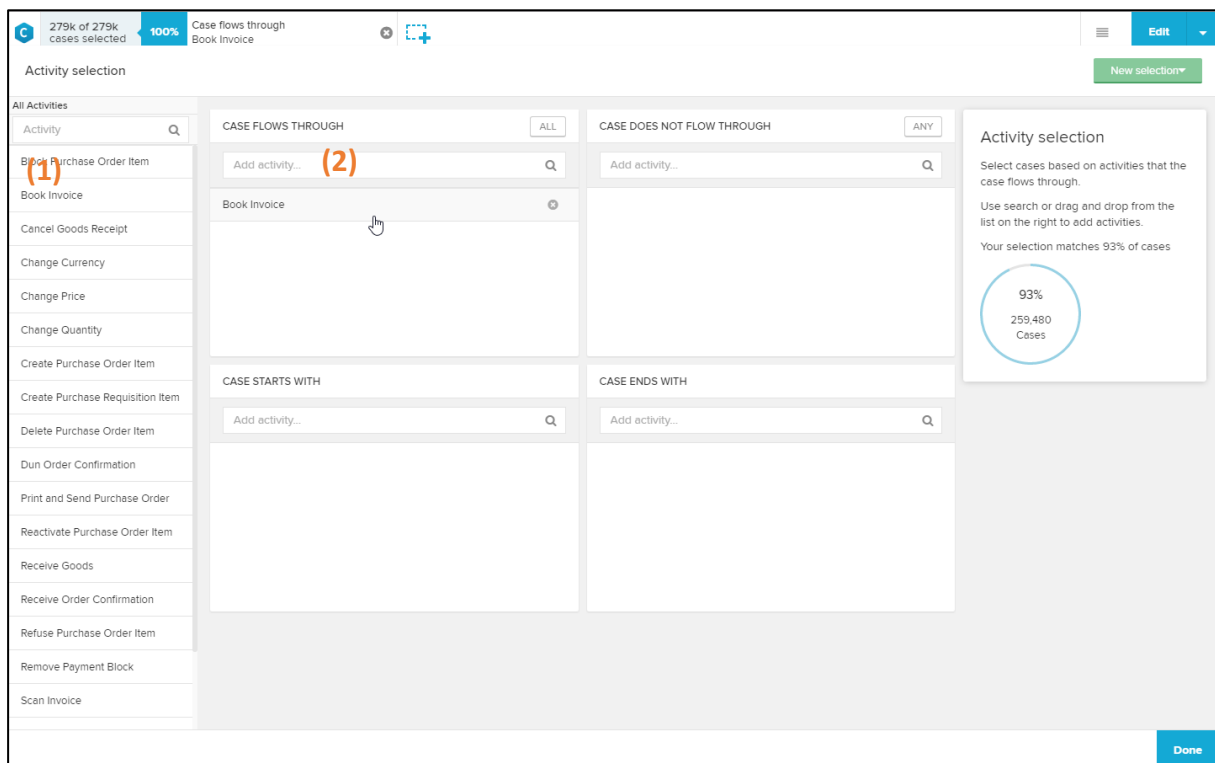
In our example, we selection for cases that specific activities. As you can see, the right side of the selection has changed, too. Here, you can see the absolute and percentage proportion of the selected cases, compared with all available cases. Please note, that this number is affected by all active selections, including the (new) selection on this page. After you are done, don't forget to confirm your selection with **DONE**.

Now your selection is set active, and appears in the selection overview.

4.2.2 ACTIVITY SELECTION

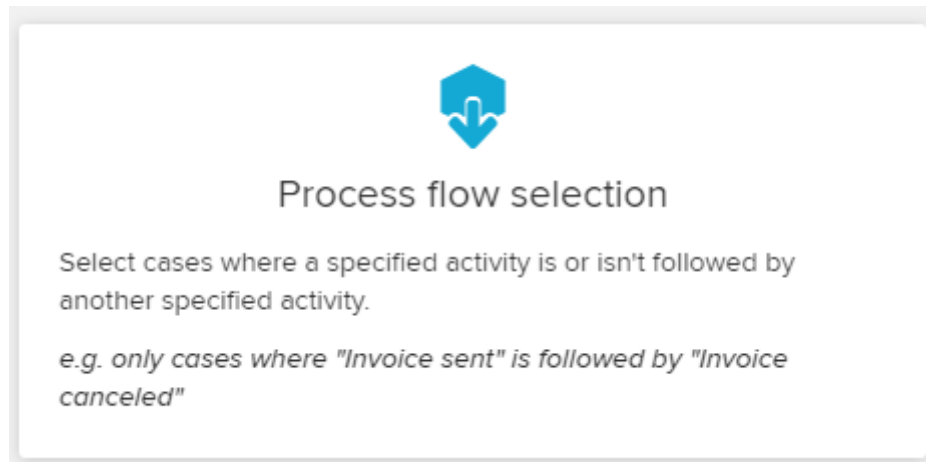


With the Activity selection, you can select cases that pass, start-/end in certain activities.

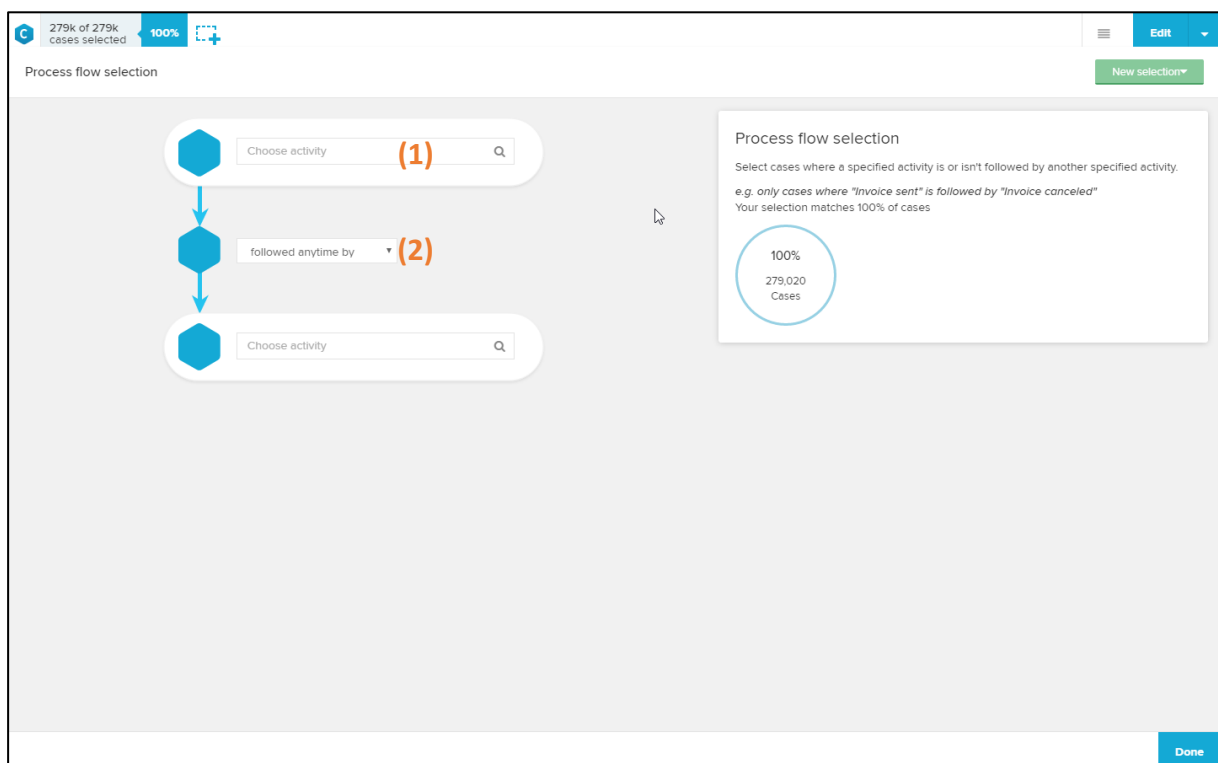


On the left side, you won't see the available tables any more but all activities (1), that are included in these tables. It is possible to create a filter for cases that flow through, do not flow through, start with or end with one or multiple activities. To apply the filter, you can either drag & drop the activity from the left to one of the 4 fields in the center or directly add the activity in one of the 4 fields in the center by searching via the input-field (2).

4.2.3 PROCESS FLOW SELECTION



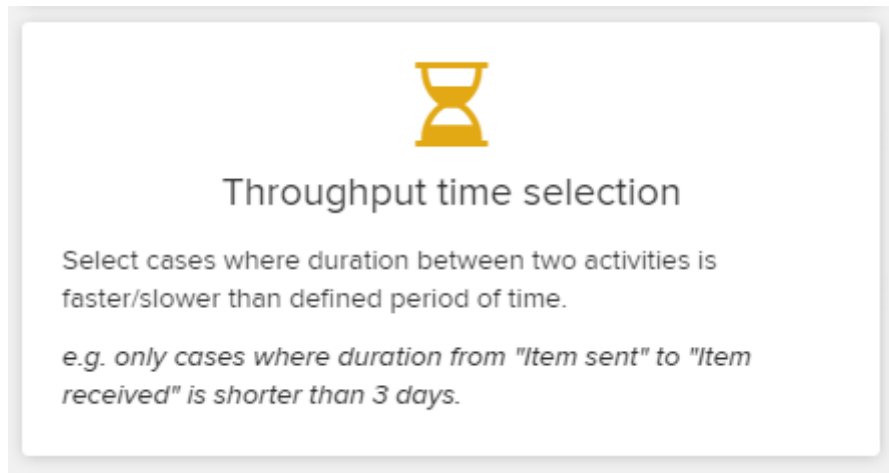
With the Process Flow Selection, you can select cases that are followed by a certain activity (or not).



In the selection fields, choose two **activities**.

Simply choose from the existing activities within your eventlog (1). Furthermore, you can decide if you want to filter for activities that are directly followed, not directly followed, indirectly followed or not indirectly followed by each other (2).

4.2.4 THROUGHPUT TIME SELECTION

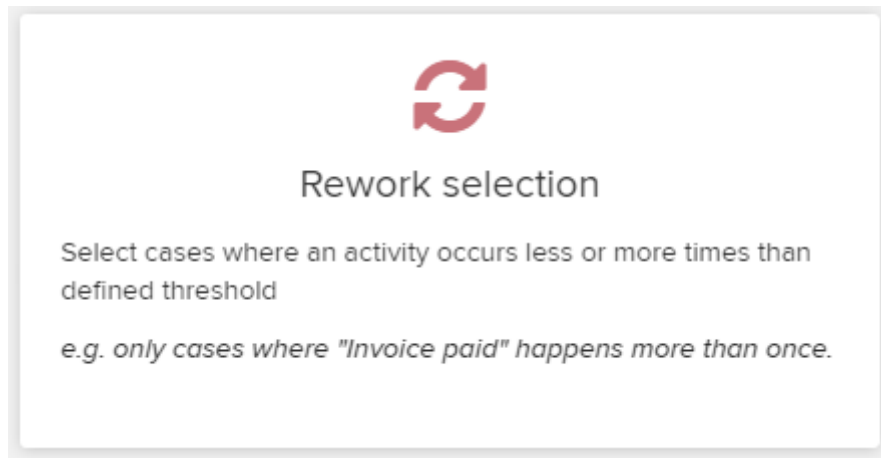


With the Throughput Time Selection, you can selection cases, whose processing time between two activities is shorter/longer than a threshold time period.

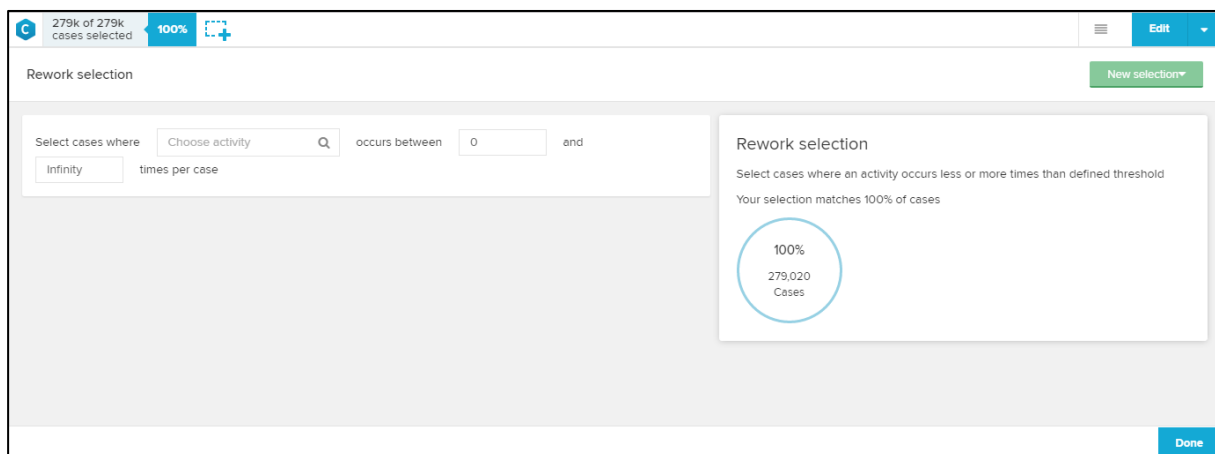
The screenshot shows the 'Throughput time selection' interface in Celonis. At the top, a status bar indicates '279k of 279k cases selected' and '100%'. The main area has two input fields: 'From first occurrence' (containing 'process start') and 'To last occurrence' (containing 'process end'). Between these fields are filters for 'From' (0), 'To' (Infinity), and a unit selector with 'Days' selected. A blue arrow points from the first field to the second. On the right, a summary box shows 'Throughput time selection' with instructions, an example, and a circular gauge indicating '100%' (279,020 Cases). A 'Done' button is at the bottom right.

Just like in the [Process Flow Selection](#) you can choose two activities and a comparison operator. This selection now compares the timestamps of these activities for each case. It returns cases that meet the requirements of the time selection which you can define with the comparison operator.

4.2.5 REWORK SELECTION

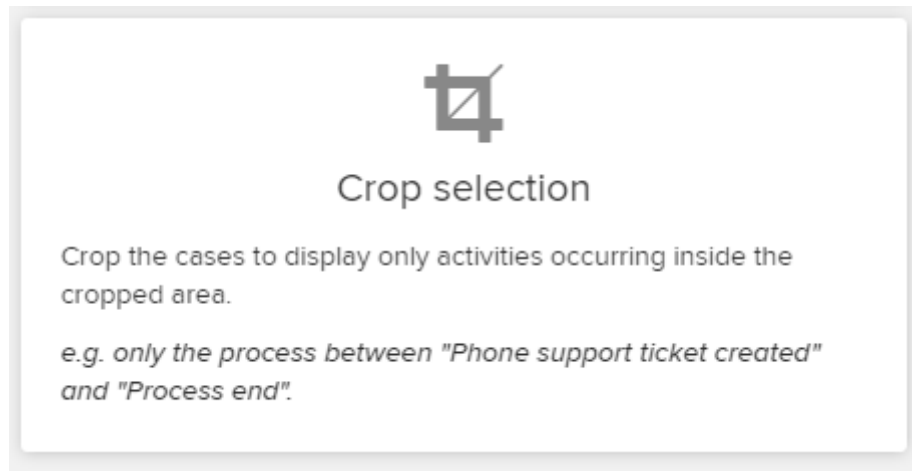


Choose this selection for cases that pass a certain activity more often or less than a certain threshold.



Choose an activity in the *Choose activity* field, and fill in a threshold value.
Between these fields, choose an operator (< or >=) that defines the selection criteria.

4.2.6 CROP SELECTION



With the crop selection, you can cut out a specific part of the process. This will result in a drill down to all the cases that go through the defined part of the process graph. The resulting graph is previewed underneath the selection input.

The screenshot shows the 'Crop selection' interface in Celonis. At the top, it indicates '279k of 279k cases selected' and '100%'. The main area is titled 'Crop selection' and contains a 'CROP PREVIEW' section. The preview shows a process flow starting with 'Process Start' (6,527) and ending with 'Process End' (6,527). The flow includes activities: 'Block Purchase Order Item' (6,527), 'Reactivate Purchase Order Item' (6,527), 'Receive Goods' (6,527), and 'Scan Invoice' (6,527). The 'Crop selection' panel on the right shows a circular progress indicator at 2% and states 'Your selection matches 2% of cases'. The 'Done' button is visible at the bottom right.




In contrast to the [Process Flow Selection](#), you do not define the exact pattern of the process but only the start and end node that have to be contained in the cases' process.

Cases that consist of additional activities before and after the start and end activity will be included, too.

4.3 COMPONENTS

SAP Process Mining by Celonis 4.2 offers a long list of available components that can be used to analyse your cases. The following pages will describe each of them, covering their functionality and configuration.











Components are structured within 4 categories:

PROCESS ANALYSIS COMPONENTS
 Process Explorer
 Variant Explorer
 Throughput Time Search
 Activity Explorer

Process Analysis Components

Get an overview of your Data by viewing and filtering your whole process model, according to various parameter.





[Learn more...](#)

CHARTS AND TABLES
 OLAP Table
 Column Chart
 Pie Chart
 Donut Chart
 Line Chart
 Area Chart
 Scatter Plot
 Bubble Plot
 Histogram Chart
 Single KPI

Charts and Tables

Get a quick view on specific dimensions, and choose from various charts, plots and tables.


[Learn more...](#)

SELECTION COMPONENTS
 Dropdown
 Date Picker
 Cropping
 Search

Selection Components

Apply a [selection](#) (to specific components or to the whole analysis document) by selecting values based on a data source.

[Learn more...](#)

DESIGN COMPONENTS
 Variable Input
 Button
 Button Dropdown
 Text Component
 Image
 Line
 Logo

Design Components

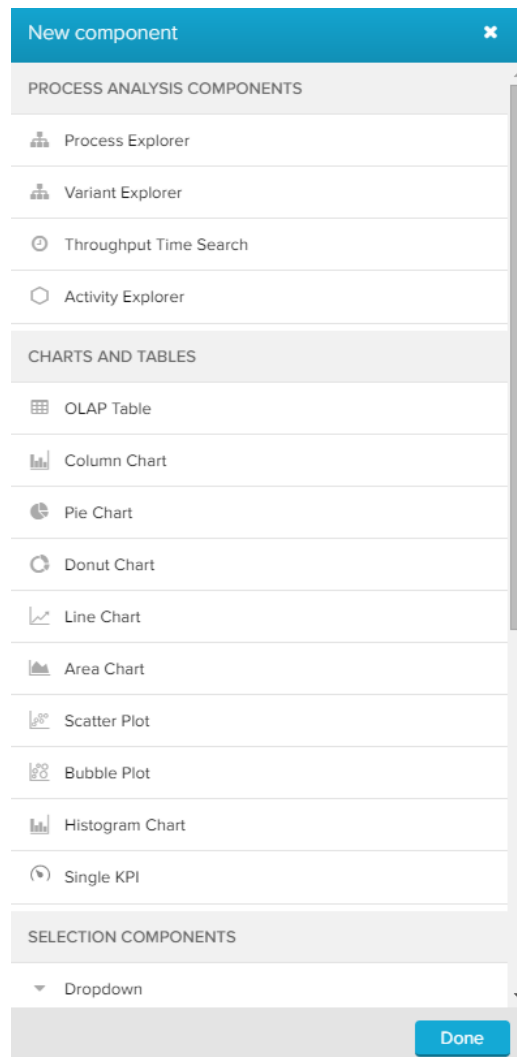
Add buttons, text components or input fields to your document, to encourage interactive navigation and dynamic interaction with your analysis. Design components are meant to help viewers to a user-friendly experience.

[Learn more...](#)

Add a new component

To add a new component, click on **? Unbekannter Anhang** in the right part of your selection bar.

This will open the following sidebar on the right side:



Now you can **drag & drop** your preferred component to the left side into the analysis sheet grid.

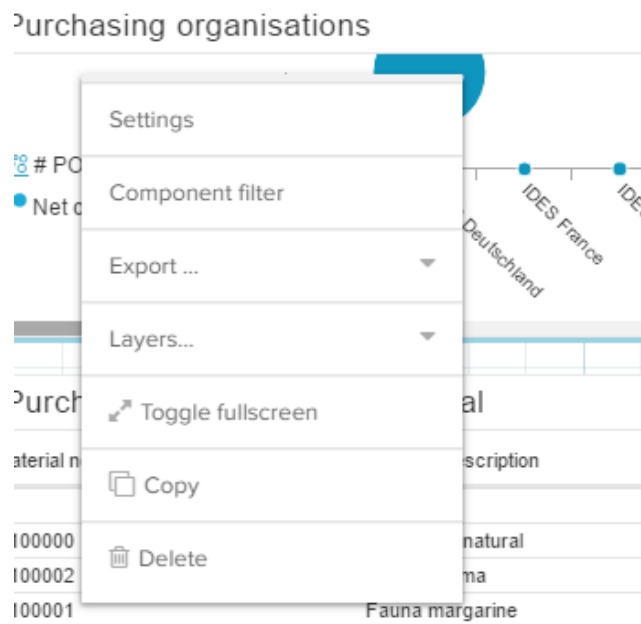
As soon as you lift off the mouse, your component will be placed at the cursor's position. After your component has been placed, the configuration settings will pop up on the right side.

4.3.1 GENERAL OPTIONS:

The configuration of all components is explained on their own pages.

However, all components share the same basic configuration.

Turn on [Edit-Mode](#) and right-click on any component.



▼ Settings

Settings will open the configuration of the component. You can find detailed description on all available settings for each component on their subpage.

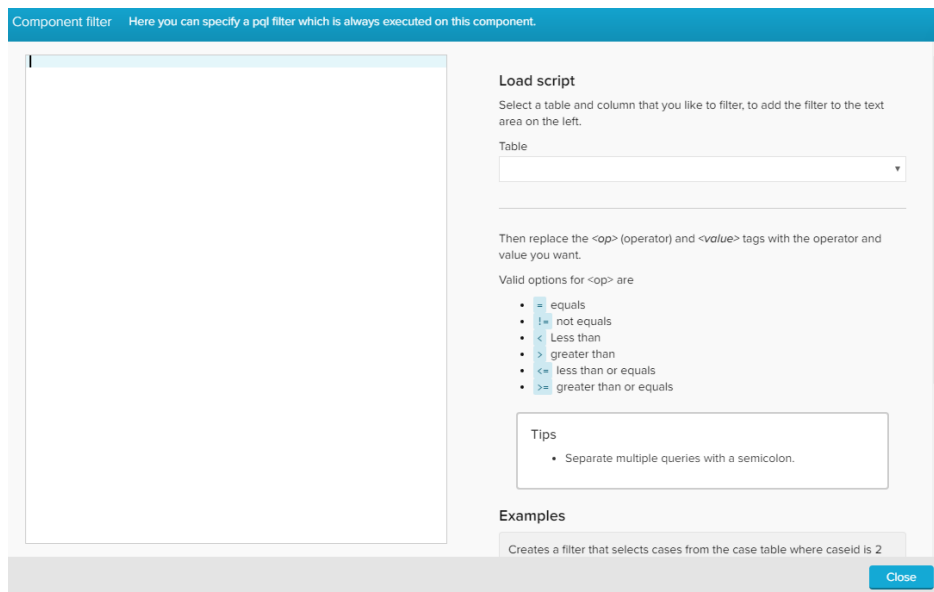
▼ Component filter

Component filters limit the data which is displayed in the component. This functionality allows you to specify which parts or your dataset are shown in each component.

Let's follow an [example](#):

For a OLAP-table listening purchase order items, we only want to see purchase order items with the material number E-023102.

Right - click on the OLAP-table and choose "Component filter". The following window will appear:



Component filter are based on [PQL statements](#). You can enter any PQL statement on the left, to filter the cases that are displayed in the selected component.

To facilitate this process, SAP Process Mining by Celonis 4.2 includes **Load Scripts**, an editor to create a PQL template.

In our example, we need to focus on the "MATNR" column in the "EKPO" table.

Use the drop-downs to fill out a table and a column:

Load script

Select a table and column that you like to filter, to add the filter to the text area on the left.

Table

EKPO

Column

MATNR

Add

Confirm your selection with

Add

.

The load script editor will paste the following PQL template in the query area on the left:



```
FILTER "EKPO"."MATNR" <op> <value>
```

Now replace the <op> (operator) and <value> tags with the operator and value you want.

Valid options for <op> are

- = equals
- != not equals
- < less than
- > greater than
- <= less than or equals
- >= greater than or equals

If you want to add multiple queries, please separate them with a semicolon.

For our example, the statement has to be the following:



```
FILTER "EKPO"."MATNR" = 'E-023102';
```

Further examples

Example 1

```
filter "case_table"."case_id" = 2;
```

Creates a selection that selects cases from the case table where the case_id equals 2.

Example 2

```
filter "case_table"."case_id" = 2;
filter "activity_table"."activity_text" LIKE "%PO%";
```

Creates a selection with cases where the case_id equals 2 and the activity_text contains the string 'PO'.

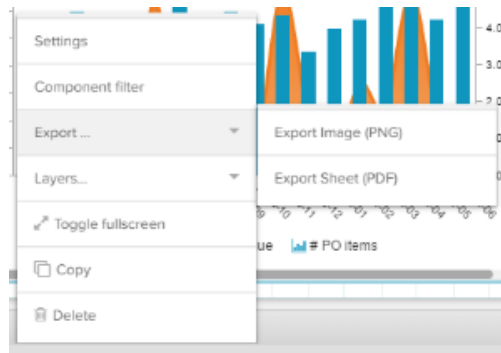
Example 3

```
filter YEAR("case_table"."case_start_time") = 2010;
```

Creates a selection with cases where case_start_time is in the year 2010.

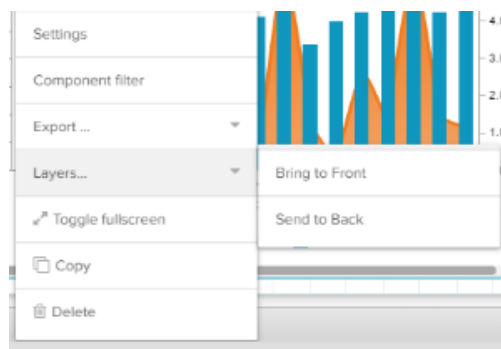
▼ Export...

You can download a copy of the selected component as an image (.png) or even the whole analysis sheet as a document (pdf). This is very useful to include analysis results in offline presentations. Choose your format and a document will be stored on your hard drive. If nothing else has been specified, it will be stored in your default download-directory.



▼ Layers

As you can drag & drop and scale SAP Process Mining by Celonis 4.2 components to any point and size within the analysis sheet, overlaps can't be ruled out. If overlaps occur, you can specify whether this document is to be shown in the foreground ("Bring to Front") or in the background ("Send to Back").



▼ Copy & Paste

As every other object in SAP Process Mining by Celonis 4.2, components can be copied and pasted in any other analysis sheet. The "Paste" - option is only visible, when a component has been copied. Click on an empty area on your analysis grid, perform a right-click and choose "paste".

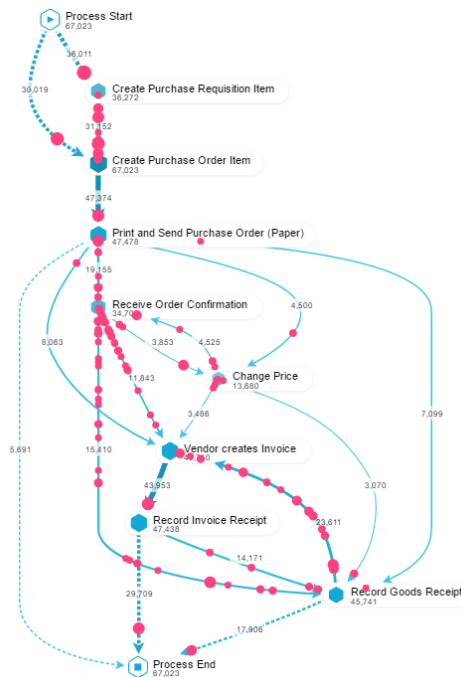
▼ Delete

Choose "Delete" to remove this component from your analysis sheet. Please note, that a deleted component can't be restored.

4.3.2 PROCESS ANALYSIS COMPONENTS

4.3.2.1 The Process Explorer

The process explorer component allows you to insert the process explorer into your analysis sheets.



We already talked about the process explorer in the viewer chapter. For this reason, this chapter will focus on the configuration of the process explorer.

[Follow this link](#) to learn more about the possibilities and the interaction with the process explorer as a viewer.

In the **settings**, you can specify general options, grouping and coloring of the activity nodes.

Right click on your process-explorer and choose "Settings" to open the settings on the right side.

PE: General options

▼ Title

Type your desired title into the text field.

When a title is set, its formatting option will be shown directly as the next settings and font, size, color and alignment can be defined.

▼ Border Options

Activate the "Show Border" checkbox to surround your explorer with a border.

You can specify the thickness, style, color and opacity of the borderline.

BORDER OPTIONS

☒ Show Border

Thickness

Style

Color

Opacity 60%

▼ Background Options

Set a background color for your explorer!

Activate the "Show background" checkbox, select a color and adjust the opacity.

BACKGROUND OPTIONS

☒ Show background

Opacity 30%

Color

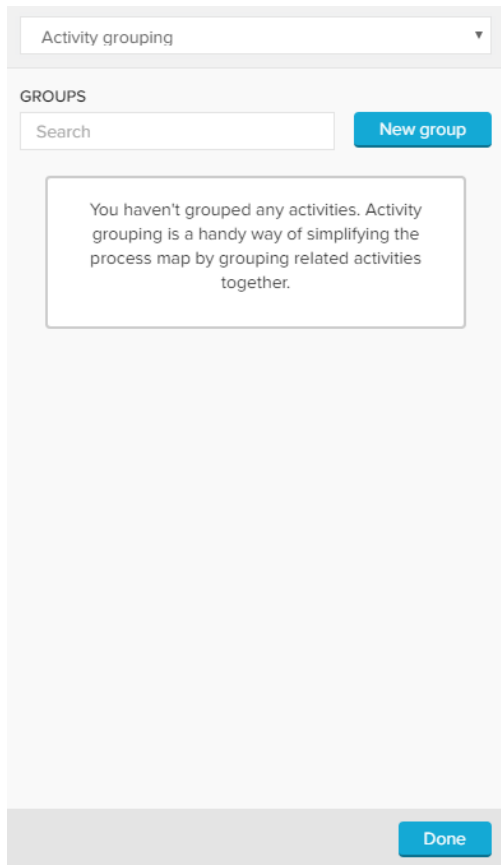
▼ Other Options

If you don't want your explorer to be affected by *any* external [selection](#) (except for internal component filter and [Process Explorer selections](#)), activate the "Component is not filtered with selections" checkbox.

☒ Component is not filtered with selections


PE: Activity grouping

You can group activities to be displayed as a single activity.



The screenshot shows a dialog box titled 'Activity grouping'. At the top, there is a dropdown menu with 'Activity grouping' selected. Below this, the section is labeled 'GROUPS'. It contains a search input field with the placeholder text 'Search' and a blue button labeled 'New group'. A message box in the center states: 'You haven't grouped any activities. Activity grouping is a handy way of simplifying the process map by grouping related activities together.' At the bottom right of the dialog, there is a blue button labeled 'Done'.

Let's assume, we want to group the activities "Print and Send Purchase Order (Paper)", "Send Purchase Order (eOrder)", "Send Purchase Order (eMail)" and "Send Purchase Order Update".

Click on . The following window will open:

New group

Title
Send Purchase Order

Search by activity name

- ☒ Print and Send Purchase Order (Paper)
- ☒ Send Purchase Order (eMail)
- ☒ Send Purchase Order (eOrder)
- ☒ Send Purchase Order Update
- ☐ Delete Purchase Requisition Item
- ☐ Cancel Invoice Receipt
- ☐ Change Currency
- ☐ Change PR Approval
- ☐ Change Vendor
- ☐ Create Purchase Order Item
- ☐ Create Purchase Requisition Item
- ☐ Delete Purchase Order Item
- ☐ Change Price
- ☐ Dun Order Confirmation
- ☐ Cancel Goods Receipt
- ☐ Reactivate Purchase Order Item

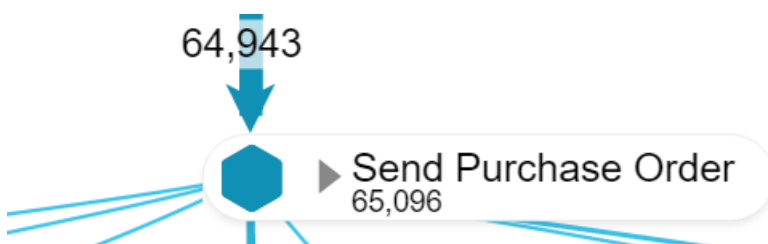
Select all activities, and (optionally) name your group. The name will be displayed in the Selection Bar and in the Process Explorer.

Search Field


Use the Search Field to search for any activity.


Confirm your selection with

The new group will now combine all incoming cases.




Recognize a group

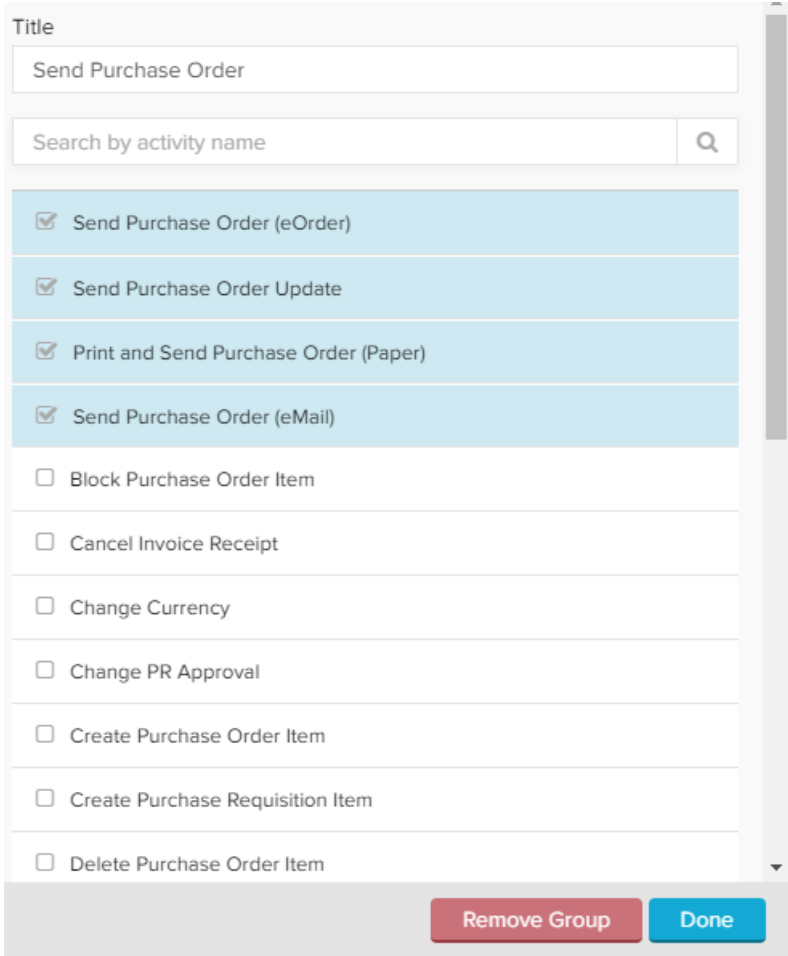
You can recognize a group by the small  icon next to the group name.

With "**Expand Group**" you will temporarily dissolve the group. All included activities will show up in the Process Map again, with a small  icon attached. Right-click on any of these activities and choose "**Collapse Group**" to resolve the group.

These options are even available for viewers of your analysis (with no edit-rights).


To edit your group, choose your group from the Activity grouping settings.

In the known window, you can now remove or add activities or remove the group with the  button.



Title

Send Purchase Order

Search by activity name 

- ☒ Send Purchase Order (eOrder)
- ☒ Send Purchase Order Update
- ☒ Print and Send Purchase Order (Paper)
- ☒ Send Purchase Order (eMail)
- ☐ Block Purchase Order Item
- ☐ Cancel Invoice Receipt
- ☐ Change Currency
- ☐ Change PR Approval
- ☐ Create Purchase Order Item
- ☐ Create Purchase Requisition Item
- ☐ Delete Purchase Order Item

Remove Group Done

PE: Custom KPI View

Custom KPI Views are additional KPIs that can be displayed in the Process Explorer.

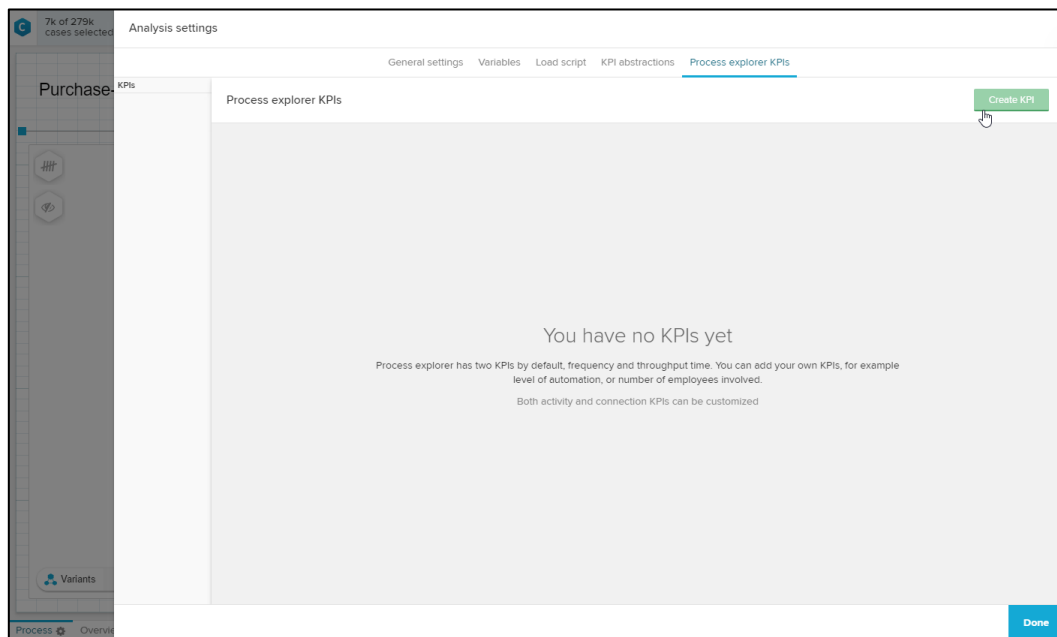
You should already be familiar with the default [KPIs of the Process Explorer](#), which are available by default in all SAP Process Mining by Celonis 4.2 installations.

Choose the KPI views in the same place where you switch between the frequency Process Explorer and the Throughput

Time Explorer:



To add a custom KPI, choose [Add Custom KPI View](#) at the bottom of the drop-down menu, listing all existing KPIs.



In a KPI view, the analyst must define **activity KPIs** and **connection KPIs**.

Add a new KPI view with:

Create KPI

You will see all possible configuration options in the right field.

Configure Custom KPIs

Activity KPIs

The screenshot shows the 'Analysis settings' dialog box with the 'Process explorer KPIs' tab selected. On the left, there is a 'KPIs' list with a 'Create KPI' button and a search bar. The main area is divided into 'Activity KPIs' and 'Connection KPIs' sections. The 'Activity KPIs' section is active, showing a 'NEW KPI' form with a 'Title' field (containing 'KPI View 1'), a 'Format according to' dropdown, and a 'THRESHOLDS' section with an 'Add threshold' button and a 'Reverse activity size' checkbox. The 'Add' button in the 'Activity KPIs' section is highlighted with a red box.

Connection KPIs

The screenshot shows the 'Analysis settings' dialog box with the 'Process explorer KPIs' tab selected. The 'Connection KPIs' section is active, showing a 'NEW KPI' form with a 'Title' field (containing 'KPI View 1') and a 'New connection KPI' button. The 'New connection KPI' button is highlighted with a red box.

Click on the "Add" button to add a custom activity KPI.

Click on the "New connection KPI" button to create a new connection KPI.

Enter your [PQL query](#) in the "Edit Formula" field on the left side. You can make use of the KPI Builder, to prevent errors that may arise through misspelling.

Process explorer KPI editor

EDIT FORMULA

```
AVG(CASE WHEN "_CEL_P2P_ACTIVITIES"."USER_TYPE" = 'Batch' THEN 1.0 ELSE 0.0 END)
```

KPI BUILDER

Use KPI builder to create custom KPIs. Custom KPIs can be shown either at the node or the connections of the Process Explorer.

table

_CEL_P2P_ACTIVITIES

Column

USER_TYPE

Add

FORMULA OPTIONS

Formula title

Automatisation Rate

Predefined formats

Decimal Number (##.##)

Formatting formula

.,2f

Units

EXAMPLES

Last timestamp

```
MAX(ROUND_MONTH("EVENTLOG"."EVENTTIME"))
```

Automatisation

```
AVG(CASE WHEN "EVENTLOG"."USERTYPE" = 'Batch' THEN 1.0 ELSE 0.0 END)
```

Done

Process explorer KPI editor

EDIT FORMULA

```
MAX(1.0*DATEDIFF(dd, SOURCE("_CEL_P2P_ACTIVITIES"."EVENTTIME"),TARGET("_CEL_P2P_ACTIVITIES"
```

KPI BUILDER

Use KPI builder to create custom KPIs. Custom KPIs can be shown either at the node or the connections of the Process Explorer.

table

TARGET_ACTIVITY(_CEL_P2P_ACTIVITIES)

Column

EVENTTIME

Add

FORMULA OPTIONS

Formula title

Formula 1

Predefined formats

Rounded number (##.##)

Formatting formula

.f

Units

d

EXAMPLES

Duration

```
AVG(1.0*DATEDIFF(dd, SOURCE("EVENTLOG"."EVENTTIME"), TARGET("EVENTLOG"."EVENTTIME")))
```

Automatisation

```
AVG(CASE WHEN TARGET("EVENTLOG"."USERTYPE") = 'Batch' THEN 1.0 ELSE 0.0 END)
```

Done

This sample activity KPI will show the automatization rate for each activity, given that there is a generic user in the database (called 'batch') that is used when a process has been automated.

The following PQL query has been used:

Automatization Rate

```
AVG(CASE WHEN "_CEL_P2P_ACTIVITIES"."USER_TYPE" = 'Batch' THEN 1.0 ELSE 0.0)
```

If this activity has been automated, the KPI compiler will return 1.0 if not 0.0. After an iteration over all activities, this query will return a value between 0.0 and 1.0 for all activities.

This sample connection KPI will provide the maximum duration of any case passing the connection (= the maximum throughput time).

The following PQL query has been used:

Max Duration

```
MAX(1.0*DATEDIFF(dd, SOURCE("_CEL_P2P_ACTIVITIES"."EVENTTIME"),TARGET("_CEL_P2P_ACTIVITIES"."EVENTTIME")))
```

This statement again iterates over all cases and compares for every connection the timestamp of the first activity with the timestamp of the last activity. For each connection, the maximum duration is selected and returned.

You can furthermore **name** your formula, and define **formats** and **units**:

FORMULA OPTIONS

Formula title

Max Duration

Translate

Predefined formats

Rounded number (#,###) ▼

Formatting formula

,f

Documentation

Units

d

Click on [Done](#) to proceed.

Multiple KPIs

For every custom KPI view, you can add multiple activity KPIs and/or connection KPIs.

Simply repeat the instructions above.

Threshold value

To allow further restrictions on your KPI, you can add Threshold values.

Your activities or your connections can be colored per definable thresholds.

Let's color all activities, that have an automatization rate (see above) > 0.5 green.

FORMATTING

Format according to

Automatisation Rate

THRESHOLDS




if

Greater than

0.5



Save your threshold setting with .

Multiple Thresholds

You can add multiple thresholds.

Reverse activity size

By default, activity nodes are scaled according to their KPI values. Larger KPI values will grow the activity node, smaller KPI values will decrease their size.

With the checkbox ☐ Reverse activity size, you can invert this scaling. Large KPI values will decrease the node's size, smaller KPI values will increase its size.

Title & Format


You can **name your new custom KPI view**. This name will be shown in all process explorers throughout this analysis document.

Title

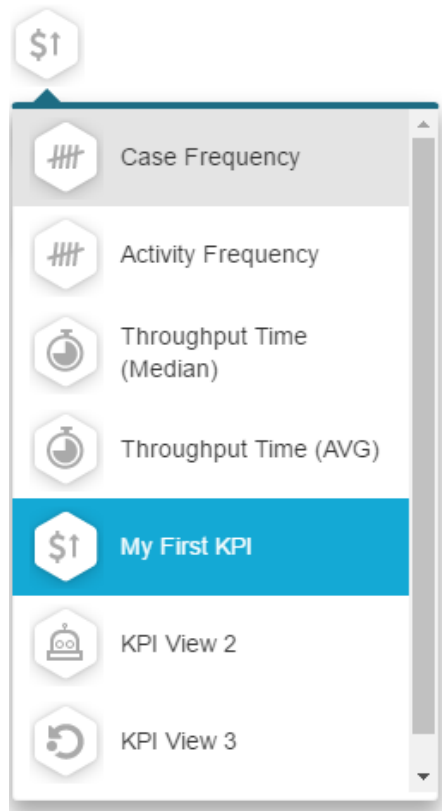
My First KP



Furthermore, you can select a symbol for your KPI view:

Save your changes with .

Now your process explorer has more KPIs!



Useful activity KPIs could be:

Last Timestamp:

MAX(ROUND_MONTH("EVENTLOG"."EVENTTIME"))

Automatization:

AVG(CASE WHEN "EVENTLOG"."USERTYPE"='Batch' THEN 1.0 ELSE 0.0 END)

Value Flow:

ROUND(SUM("EVENTLOG"."ACT_Wert"),0)

Useful connection KPIs could be:

Duration:

AVG(1.0*DATEDIFF(dd, SOURCE("EVENTLOG"."EVENTTIME"), TARGET("EVENTLOG"."EVENTTIME")))

Automatization

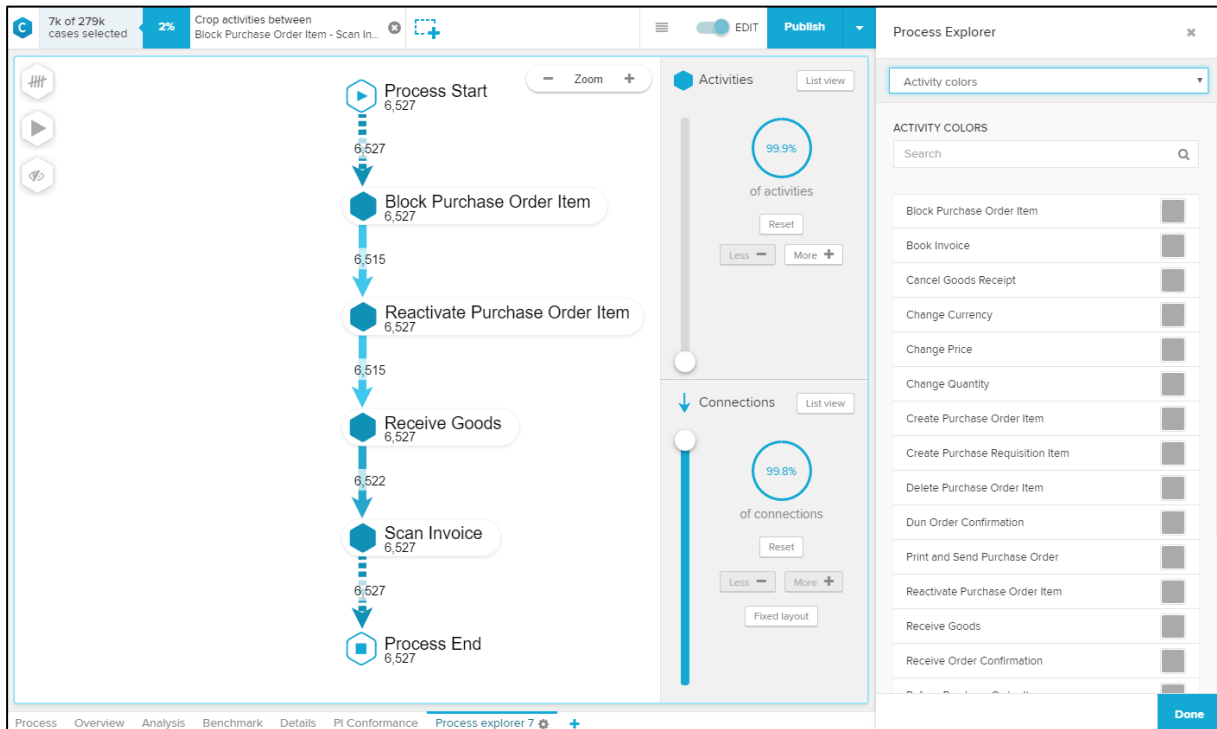
AVG(CASE WHEN SOURCE("EVENTLOG"."USER_TYPE") LIKE 'Batch' THEN 1.0 ELSE 0.0 END)


Value flow:

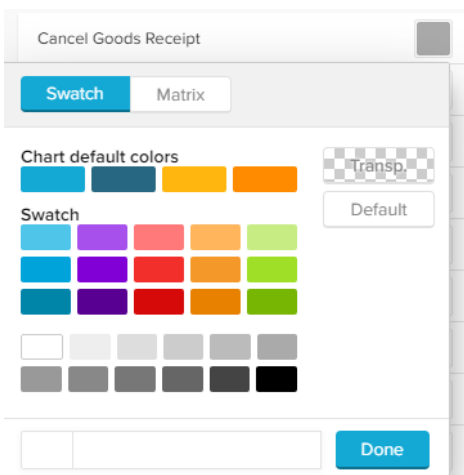
AVG(1.0*DATEDIFF(dd, SOURCE("EVENTLOG"."EVENTTIME"), TARGET("EVENTLOG"."EVENTTIME")))

PE: Activity colors

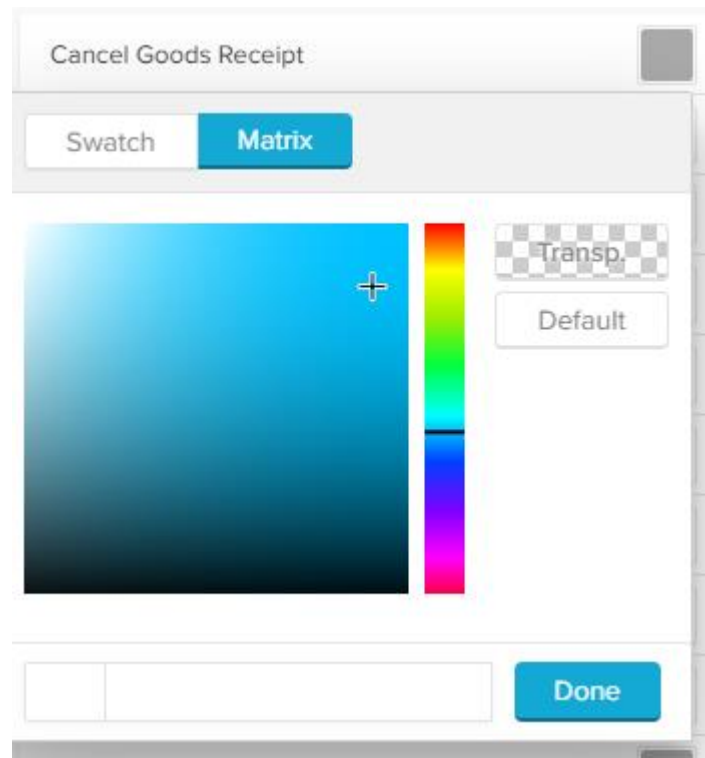
Every single activity on your process map can be colored in a different color. This can be used to highlight certain activities, that are especially relevant for your business.



Choose any activity from the activity list (or use the search field), and click on the  button, to choose a new color:



You can also switch to the Matrix color selection:

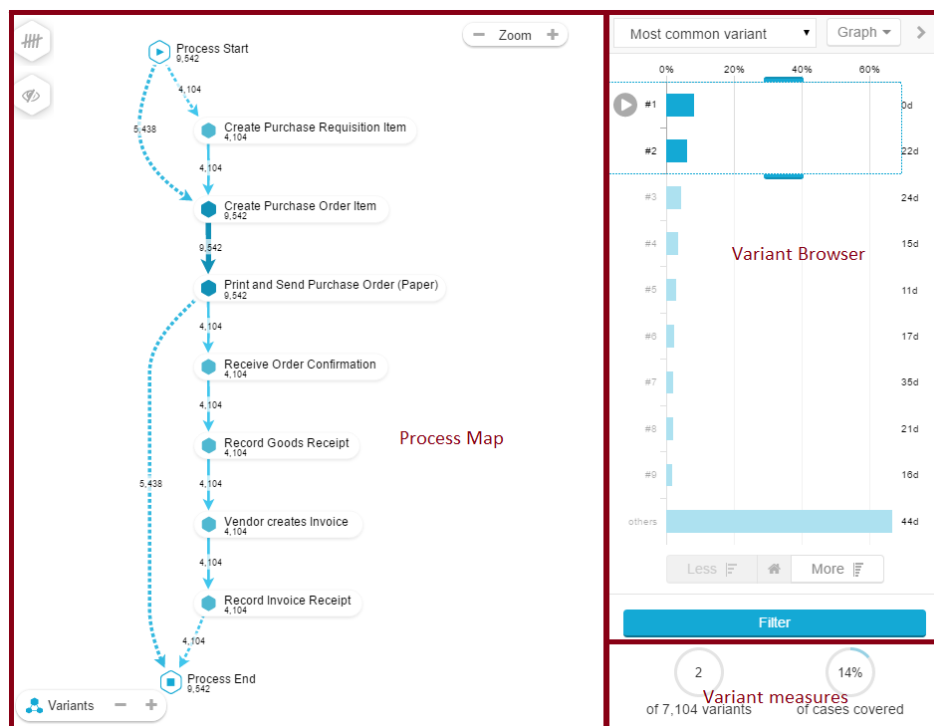


Color Groups

You can color [activity groups](#), too. They will appear in the activity selection mentioned above.

4.3.2.2 The Variant Explorer

The variant explorer allows the user to explore his process based on **end to end variants**.



Variant

A variant is an end-to-end path through the processes' activities. A specific set of activities followed by a case is called the case's variant. All different activity combinations that exist for the cases together are the processes' variants.

As you can see in the screenshot, the variant explorer is made of three parts. The **Process Map** is a [process explorer](#). You can apply your KPIs and make use of the inline activity chooser.

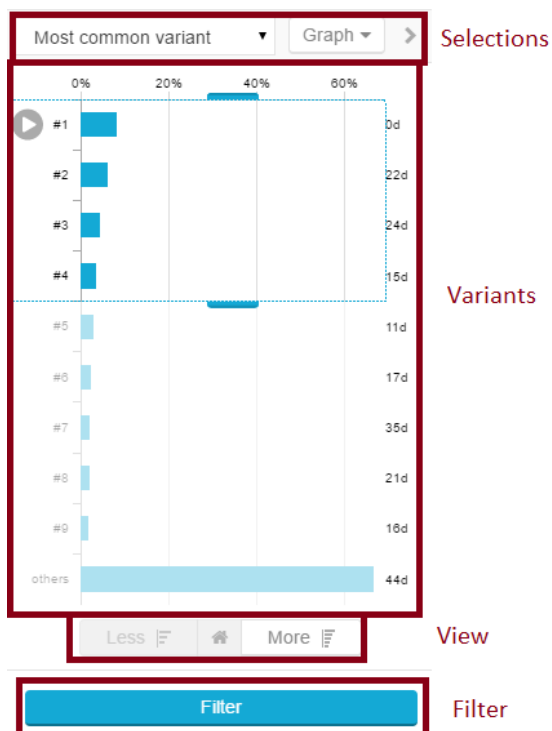
This process graph is affected by the *variants* that are selected in the **Variant Browser**. The Variant Browser displays variants according to your selections (see below). By default, 9 variants are displayed. All variants that are not displayed are combined and displayed as "others":



The **Variant measures** show quantitative measures, based on your current variant selection from the variant browser.

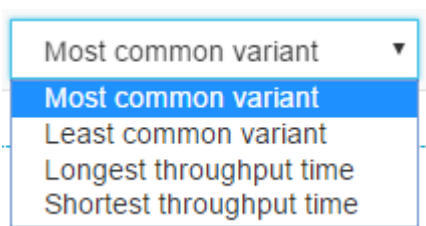
Based on the variants, you can apply a selection. As soon as you change the selected variants (Drag & Drop your mouse to change the selected variants), the process map will display all selected variants.

Let's take a closer look at the variant browser:



Sorting

In the Dropdown at the top right you can select in **which order the variants are displayed**. The following options are available:



▼ Most common variant

The most frequented variants are displayed in descending order.

▼ Least common variant

The least frequented variants are displayed in ascending order.

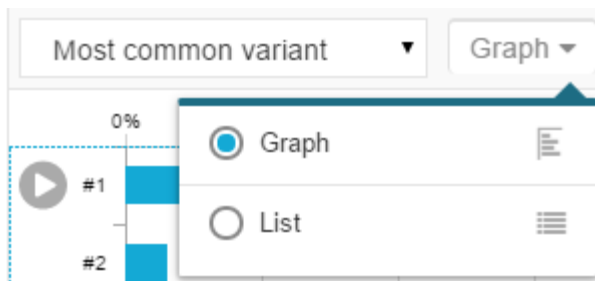
▼ Longest throughput time

The variants with the longest throughput time are displayed in descending order.

▼ Shortest throughput time

The variants with the shortest throughput time are displayed in ascending order.

Furthermore, you can change the **view** of your variant browser, using the second drop-down menu:



By default, "Graph" is selected. This will display your variants as a vertical column chart.

Choose List, to see your selected variants in a list:

Most common variant ▼

list ▼

►


☐ Select all

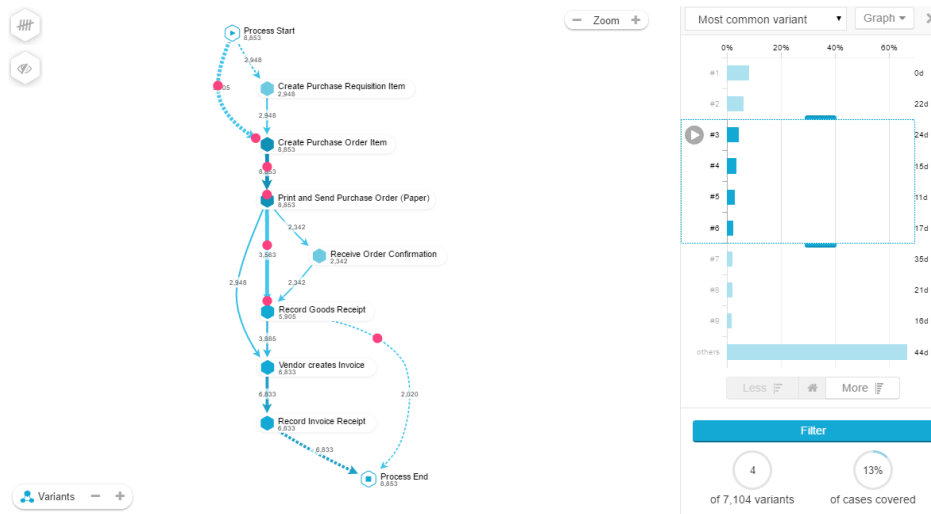
#1	8% of cases 2 Activities	0 Days Throughput time
#2	6% of cases 7 Activities	22 Days Throughput time
#3	4% of cases 5 Activities	24 Days Throughput time
#4	3% of cases 6 Activities	15 Days Throughput time
#5	3% of cases 3 Activities	11 Days Throughput time
#6	2% of cases 5 Activities	17 Days Throughput time
#7	2% of cases 7 Activities	35 Days Throughput time
#8	2% of cases 5 Activities	21 Days Throughput time
#9	2% of cases 4 Activities	16 Days Throughput time

Filter

▼ Variants

As we already know, the variants section shows all variants, by default the 9 most frequented ones in descending order.

If you hover any variant, a small  button appears next to the variant. Click on this button to see an animation of this variant in your process map.

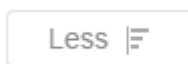


View

You can use the following icons to extend or reduce the number of variants to be displayed in the variant browser:



Adds 10 variants to your variant browser.




Reduces your variant browser by 10 variants.



Resets your variant browser to 9 variants.

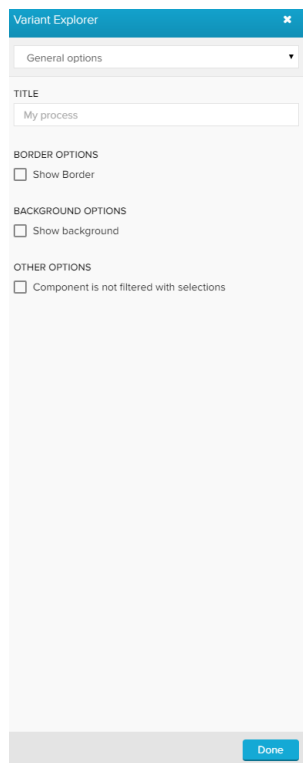
Filter

The selections that are made in the variant browser do instantly apply to the process map. If you wish to create a [Selection](#) based on your selected variants, click on . The selection will be set active and will be shown in the selection bar.

Please Note:

Please note that your variant browser displays variants that meet the criteria set by active selections. For this reason, your variant browser might adopt if you apply a selection based on this variant filter.

VE: General options



The screenshot shows the 'Variant Explorer' dialog box with the 'General options' tab selected. It contains a 'TITLE' text field with the value 'My process'. Below this are three sections of options: 'BORDER OPTIONS' with a checkbox for 'Show Border', 'BACKGROUND OPTIONS' with a checkbox for 'Show background', and 'OTHER OPTIONS' with a checkbox for 'Component is not filtered with selections'. A 'Done' button is at the bottom right.

▼ Title

Type your desired title into the text field.

When a title is set, its formatting option will be shown directly as the next settings and font, size, color and alignment can be defined.

TITLE

My first process explorer

TITLE FORMATTING

Font: Sans serif Size: x-large 17px

☐ B ☐ I ☐ U
 ☐ A ☐ ↗ ☐ □
 ☐ ≡ ☐ ≡ ☐ ≡

▼ Border Options

Activate the "Show Border" checkbox to surround your explorer with a border.

You can specify the thickness, style, color and opacity of the borderline.

BORDER OPTIONS

☒ Show Border

Thickness:

Style:

Color:

Opacity:


▼ Background Options


Set a background color for your explorer!

Activate the "Show background" checkbox, select a color and adjust the opacity.

BACKGROUND OPTIONS

☒ Show background

Opacity  30%

Color 

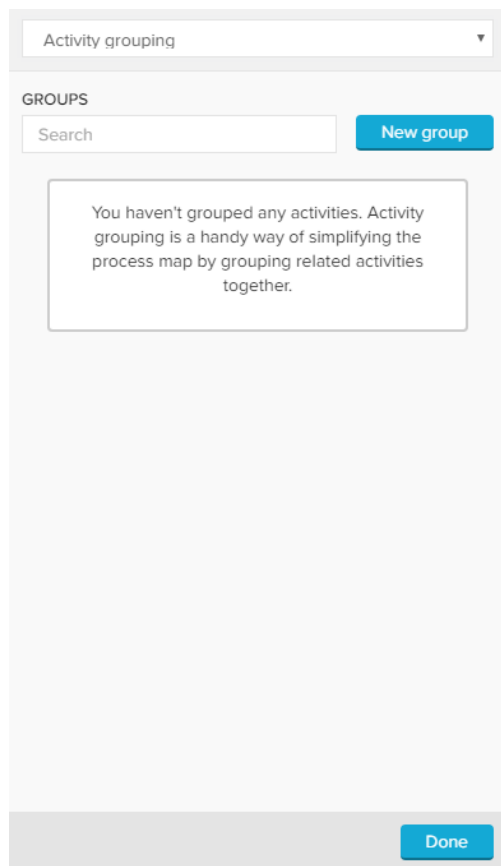
▼ Other Options

If you don't want your explorer to be affected by *any* external [selection](#), activate the "Component is not filtered with selections" checkbox.

☒ Component is not filtered with selections

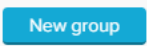
VE: Activity grouping

You can group activities to be displayed as a single activity.



The screenshot shows a dialog box titled 'Activity grouping'. At the top, there is a dropdown menu with 'Activity grouping' selected. Below this, the section is labeled 'GROUPS'. It contains a search input field with the placeholder text 'Search' and a blue button labeled 'New group'. A message box in the center states: 'You haven't grouped any activities. Activity grouping is a handy way of simplifying the process map by grouping related activities together.' At the bottom right of the dialog, there is a blue button labeled 'Done'.

Let's assume, we want to group the activities "Print and Send Purchase Order (Paper)", "Send Purchase Order (eOrder)", "Send Purchase Order (eMail)" and "Send Purchase Order Update".

Click on . The following window will open:

New group

Title
Send Purchase Order

Search by activity name

- ☒ Print and Send Purchase Order (Paper)
- ☒ Send Purchase Order (eMail)
- ☒ Send Purchase Order (eOrder)
- ☒ Send Purchase Order Update
- ☐ Delete Purchase Requisition Item
- ☐ Cancel Invoice Receipt
- ☐ Change Currency
- ☐ Change PR Approval
- ☐ Change Vendor
- ☐ Create Purchase Order Item
- ☐ Create Purchase Requisition Item
- ☐ Delete Purchase Order Item
- ☐ Change Price
- ☐ Dun Order Confirmation
- ☐ Cancel Goods Receipt
- ☐ Reactivate Purchase Order Item

Cancel Done

Select all activities, and (optionally) name your group. The name will be displayed in the Selection Bar and in the process map.

Search Field

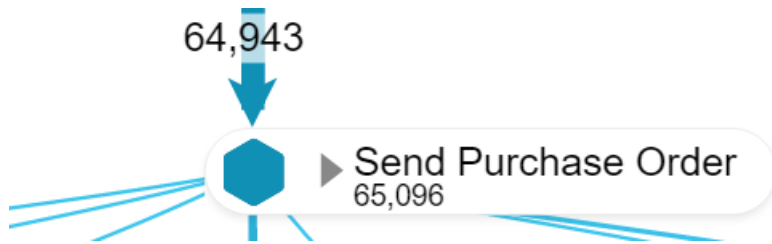
Use the Search Field to search for any activity.

Done

Confirm your selection with .

The new group will now combine all incoming cases in the process map, as well in the variant browser.

This might increase the frequency of the displayed variants, as this cumulates different activities.




Recognize a group: You can recognize a group by the small ► icon next to the group name.

With "**Expand Group**" you will temporarily dissolve the group. All included activities will show up in the Process Map again, with a small ▼ icon attached. Right-click on any of these activities and choose "**Collapse Group**" to resolve the group.

These options are even available for viewers of your analysis (with no edit-rights).

To edit your group, choose your group from the Activity grouping settings.

In the known window, you can now remove or add activities or remove the group with the  button.

Title

Send Purchase Order

Search by activity name

☒ Send Purchase Order (eOrder)

☒ Send Purchase Order Update

☒ Print and Send Purchase Order (Paper)

☒ Send Purchase Order (eMail)

☐ Block Purchase Order Item

☐ Cancel Invoice Receipt

☐ Change Currency

☐ Change PR Approval

☐ Create Purchase Order Item

☐ Create Purchase Requisition Item

☐ Delete Purchase Order Item

Remove Group

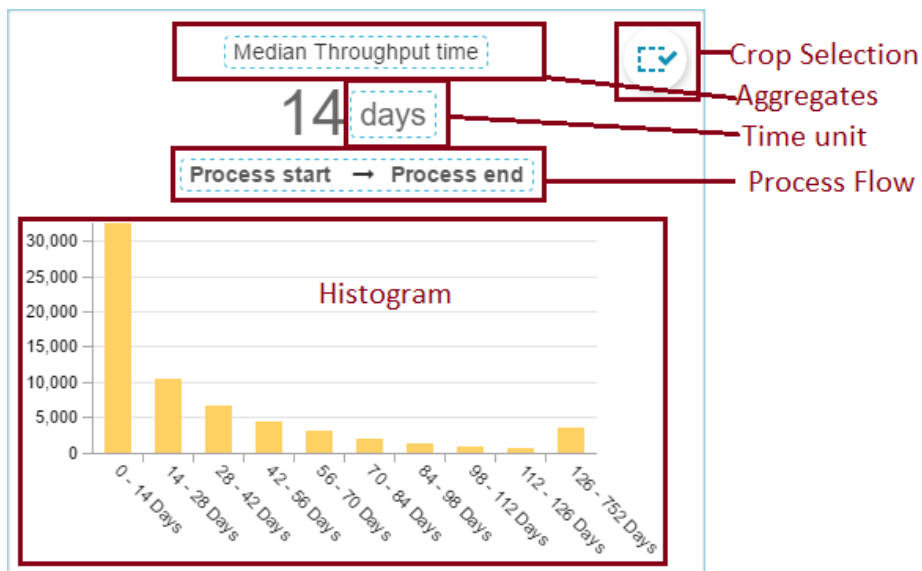
Done

VE: Activity colors

Every single activity on your process map can be colored in a different color. This can be used to highlight certain activities, that are especially relevant for your business. See for 4.3.2.1 details.

4.3.2.3 Throughput Time Search

The throughput time search allows the user to examine the throughput time between two specific activities.



Start with defining your **Process Flow**.

Process Flow

The process flow defines the **starting and ending activity** of the connection, whose throughput time is analysed in the Throughput Time Search.

Left-click on the process flow to open the following window:

From:

Process start

To:

Process end

Choose two activities (*Process start* and process end).

The Throughput Time Search will now focus on the throughput time of all cases passing these activities.

Please Note

If any other activities occur between the selected activities, the Throughput Time Search will accumulate all throughput times.

After you have selected a case in the *Process start* or *Process end* field, you can furthermore specify the **occurrence** of the activity in the process flow:

From:

Change Price

×

First occurrence

▼

First occurrence

▼

Last occurrence

▼

Cancel Goods Receipt

×

Last occurrence

▼

Done

This is only relevant for cases that pass any activity several times.

The Throughput Time Search can analyse the *First Occurrence* and the *Last Occurrence* of this activity in the process flow of each case that runs between the selected activities.

Don't forget to apply your Process Flow selection with *Done*.

After confirming your selection, the process flow will be shown above the Histogram:



You can click on the Process Flow at any time and edit your selection.

Process Flow selection

Any selection that has been made in the Process Flow selection, only applies to the Throughput Time search.

To apply a global selection based upon this selection, proceed to "Crop Selection".

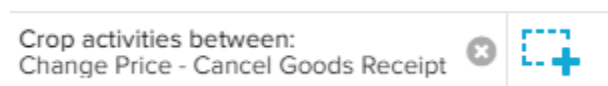
Crop Selection

After you have made a selection in the Process Flow, you can create a (global) [selection](#) based on this selection.

Click on the "Crop Selection" icon in the upper right corner of the Throughput Time search.



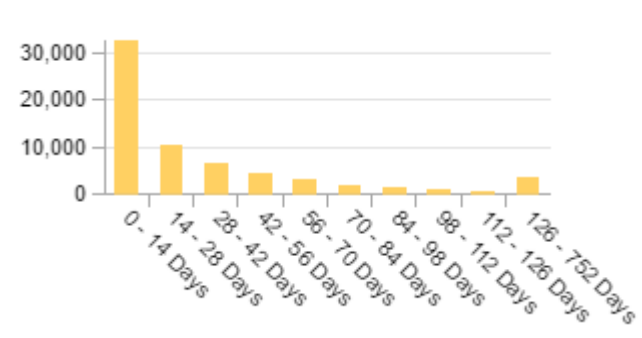
The selection will be activated immediately and added to the selection bar:



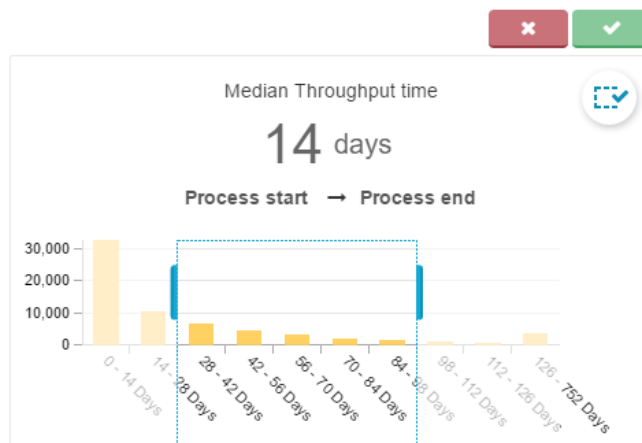
Histogram

The histogram is a bar chart, displaying time intervals on the x-axis and the number of cases whose throughput time meets the time interval (given on the x-axis) in the y-axis.

The cases are selected based on the current [Selections](#) and the above described Process Flow selection.



You can use the histogram to apply [selections](#) like in every other component:



Aggregates

Click on the Aggregates to change the aggregation of the displayed throughput time.

Average
✓ Median
Maximum
Minimum

You can aggregate the throughput times to an *average*, a *median* or display the *maximum/minimum* throughput time.

By default, *Median* is selected.

Time Unit

✓ Days
Hours
Minutes
Seconds

Click on the unit next to the Throughput Time aggregation and change it.

The following units are available:

Days, Hours, Minutes, Seconds.

By default, *Days* is selected.

TTS: Settings

The following settings are available for the Throughput Time Search:

▼ Title

Type your desired title into the text field. When a title is set, its formatting option will be shown. Font, size, color and alignment can be defined.

▼ Calculate

Click on *Calendar options*, if you wish to limit your Throughput Time search to specific times (e.g. working hours, Mo-Fr 8-18h).

If now specification has yet been made, activate the *KPI specific calendar* with *Override calendar*.



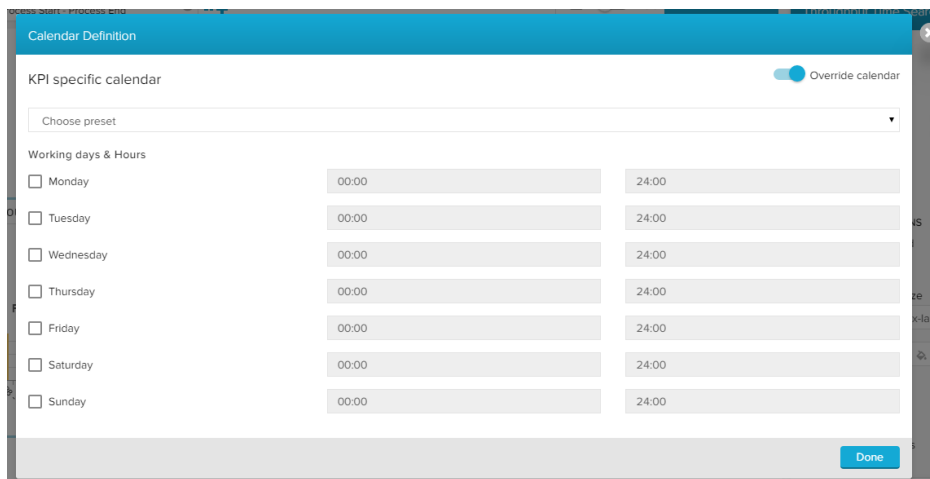
Calendar Definition

KPI specific calendar

Override calendar

Done

The following options will show up:



Calendar Definition

KPI specific calendar

Override calendar

Choose preset

Working days & Hours

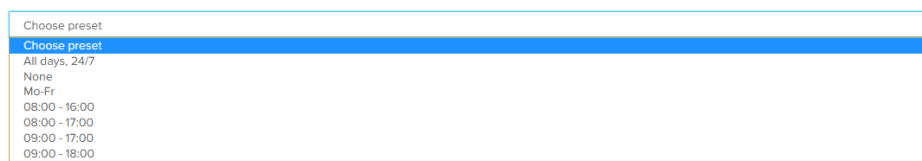
Day	Start Time	End Time
<input type="checkbox"/> Monday	00:00	24:00
<input type="checkbox"/> Tuesday	00:00	24:00
<input type="checkbox"/> Wednesday	00:00	24:00
<input type="checkbox"/> Thursday	00:00	24:00
<input type="checkbox"/> Friday	00:00	24:00
<input type="checkbox"/> Saturday	00:00	24:00
<input type="checkbox"/> Sunday	00:00	24:00

Done

Activate the days and enter the times, that you wish to limit your Throughput Time search on.

SAP Process Mining by Celonis 4.2 has already some **pre-sets** included, which might be useful.

Click the *Choose pre-set* dropdown menu and choose any option:



Choose preset

Choose preset

All days, 24/7

None

Mo-Fr

08:00 - 16:00

08:00 - 17:00

09:00 - 17:00

09:00 - 18:00

To reset all selections, choose *None*.

Confirm your calendar with Done.

▼ Throughput time color

You can change the color of the aggregated throughput time (which is displayed above the histogram).

▼ Border Options

Activate the *Show Border* checkbox to surround your explorer with a border.

You can specify the thickness, style, color and opacity of the borderline.

BORDER OPTIONS

☒ Show Border

Thickness

Style

Color

Opacity

60%

▼ Background Options

Set a background color for your explorer!

Activate the "Show background" checkbox, select a color and adjust the opacity.

BACKGROUND OPTIONS

☒ Show background

Opacity

30%

Color

▼ Hide histogram

This option hides the histogram. Only the throughput time will be displayed.

▼ Disable Selections

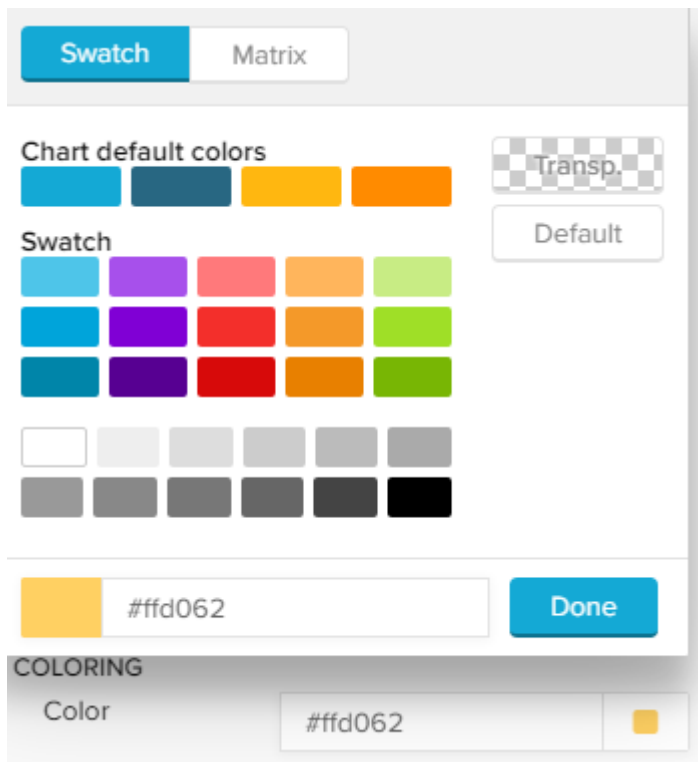
If you don't want your explorer to be affected by *any* external [selection](#) (except for the internal Process Flow selection), activate the "Disable Selections" checkbox.

▼ Coloring

There are several possibilities to color your histogram.

▼ Color

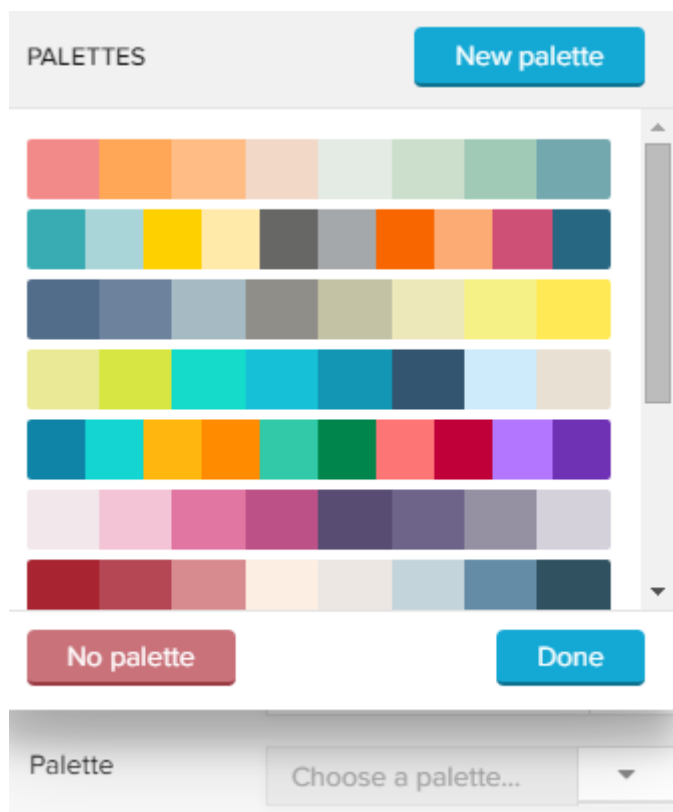
If you wish to color all bars in the **same color**, pick a color in the *Color* field.



▼ Palette

You can use a palette to color your bars in **different colors**.

SAP Process Mining by Celonis 4.2 comes with a set of pre-defined palettes, which can be accessed with the small icon.



Choose any palette and click on *Done* or choose *New palette* to define a **custom palette**.

The palette editor will show up:

Palette Editor

Palette preview

☐ Apply linear gradient

Choose palette colors

Color

#5BC6E6

Add Color

Delete

Done

Click on  to add up to 20 colors!

Palette Editor

Palette preview

☐ Apply linear gradient

Choose palette colors

Color

#5BC6E6

Color

#1f77b4

Color

#ff7f0e

Color

#2ca02c

Color

#d62728

Color

#9467bd

Color

#8c564b

Color

#e377c2

Color

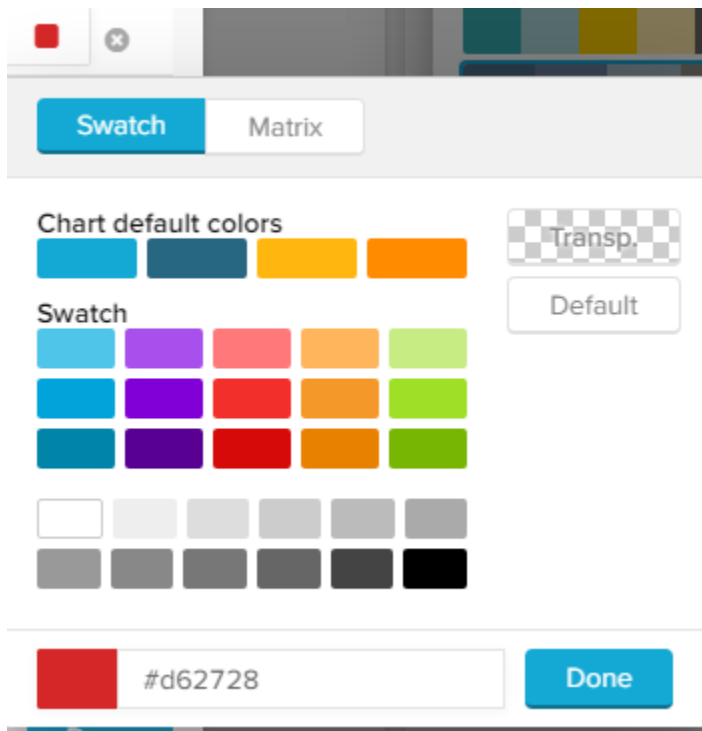
#7f7f7f

Add Color


Delete

Done

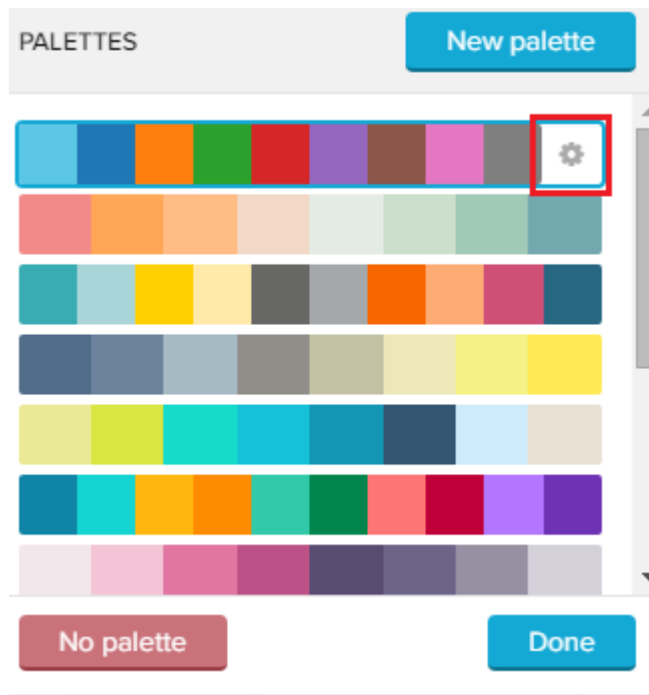
You can edit each color by clicking on the small colored square next to each color:



You can furthermore add a **linear gradient** to your palette. This will split your selected colors up into 20 gradient colors, which fade linear between two colors.

Don't forget to apply your palette with .

Your new palette has now been added, and can be edited with the small icon next to your custom palette:



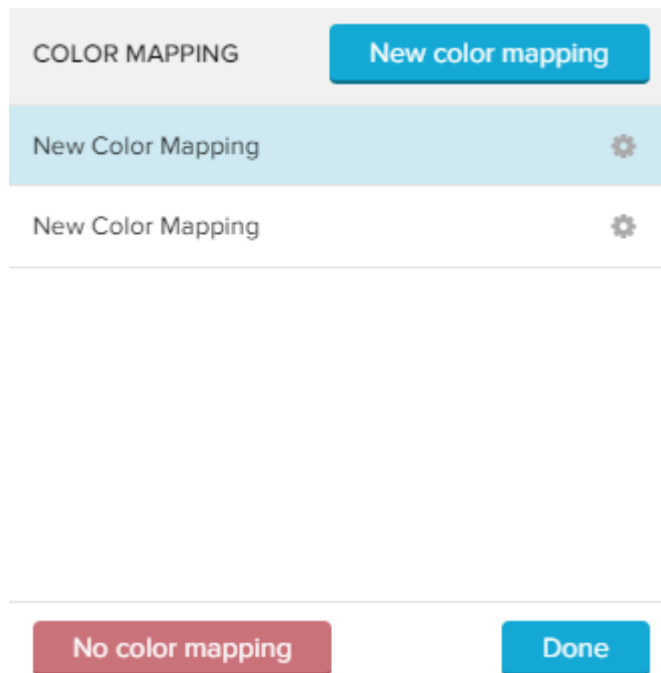
While editing a palette, you can **delete** it by clicking on .

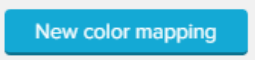
▼ Color mapping

This method allows bar coloring according to different criteria.

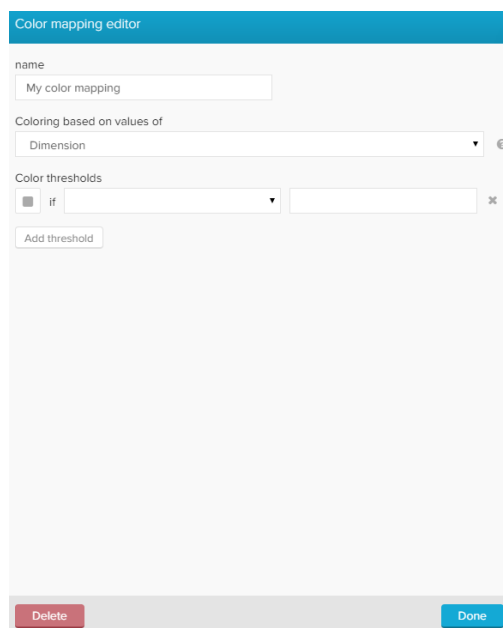
For example, critical values can be highlighted with a different color.

Click on the small  icon to get started!



To add a new color mapping, click on  in the upper right corner.

The following **color mapping editor** will open:



First, let's give our new color mapping a **title** in the upper text-field.

You can furthermore choose coloring based on values of *Dimensions* or *Series* (which is selected by default).

For the Throughput Time search, we strongly recommend to apply colors based on *Series*, as dimensions are aggregated on the x-axis, and may change per further selections.

Series allows you to define certain areas on your y-axis (number of cases) to be colored differently.

Therefore, we need to define **color thresholds**.

For each threshold, we can specify a comparison function as well as the actual threshold value.

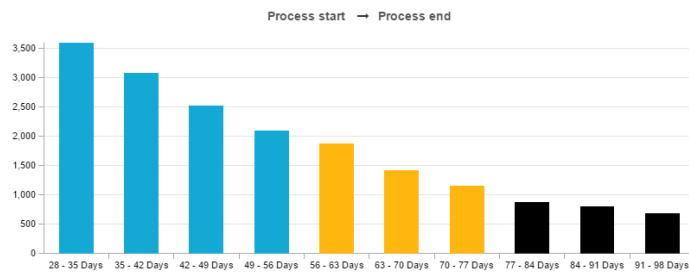
Let's examine the following example:

We want to color all process aggregations which occur at least 2000 times for a throughput time interval blue, all bars with a series between 1000 and 2000 yellow, and all other aggregations (<1000) black.

The following threshold settings need to be made:

The screenshot shows the 'Color mapping editor' window. It has a title bar 'Color mapping editor' in blue. Below it, there's a 'name' field with the text 'My color mapping'. Underneath is a dropdown menu 'Coloring based on values of' with 'Series' selected. The 'Color thresholds' section contains three rows, each with a color swatch, a comparison operator, and a threshold value. The first row has a black swatch, 'Less than', and '1000'. The second row has a yellow swatch, 'Greater than/equal', and '1000'. The third row has a blue swatch, 'Greater than/equal', and '2000'. Each row has a small 'X' icon to its right. Below these rows is an 'Add threshold' button. At the bottom of the window are two buttons: 'Delete' (red) and 'Done' (blue).

Color	Condition	Value
Black	Less than	1000
Yellow	Greater than/equal	1000
Blue	Greater than/equal	2000



Sorting sequence

SAP Process Mining by Celonis 4.2 prioritizes color threshold settings which have been added recently.

To prevent any coloring overlaps, we strongly recommend to start with the lowest number of cases.

▼ Opacity

With the opacity slide control, you can adjust the opacity of the bars in your histogram.

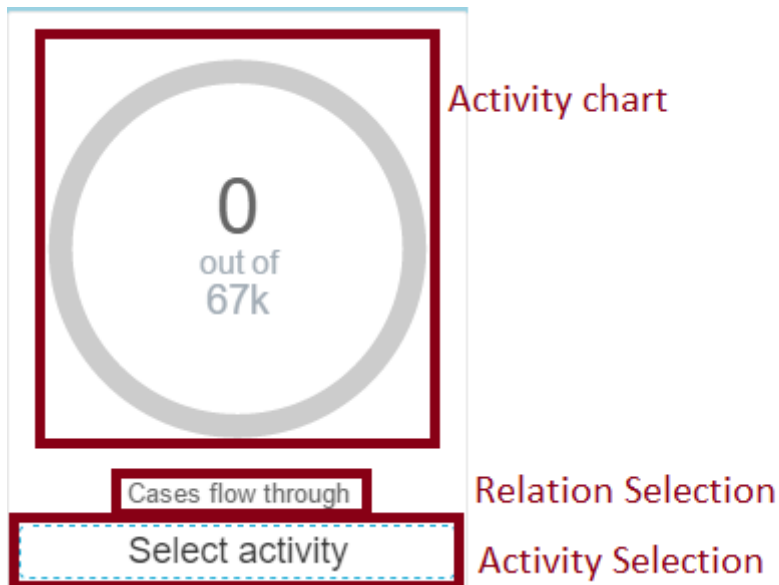
By default, 100% is selected.



4.3.2.4 Activity Explorer

The Activity Explorer provides an easy alternative to find out, how activities relate to your process.

This is how an "empty" activity explorer looks like:

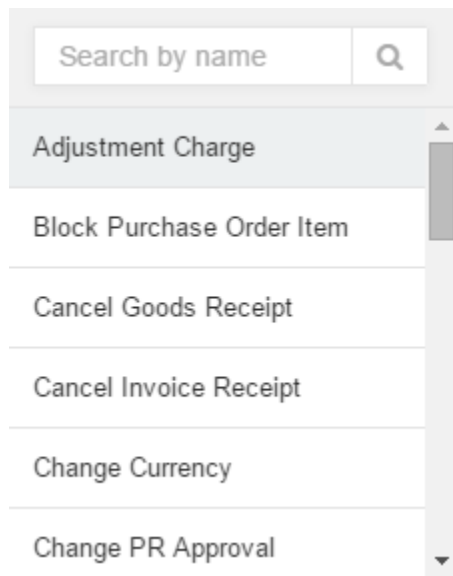


Activity Selection

Start with selecting one activity for your analysis.

Click on *Select activity* (or on the selected activity, if one activity is already selected here).

The following window will open:



A screenshot of a search dropdown menu. At the top is a search bar with the placeholder text "Search by name" and a magnifying glass icon. Below the search bar is a list of activities. The first item, "Adjustment Charge", is highlighted with a light gray background. The other items are "Block Purchase Order Item", "Cancel Goods Receipt", "Cancel Invoice Receipt", "Change Currency", and "Change PR Approval". A vertical scrollbar is visible on the right side of the list.

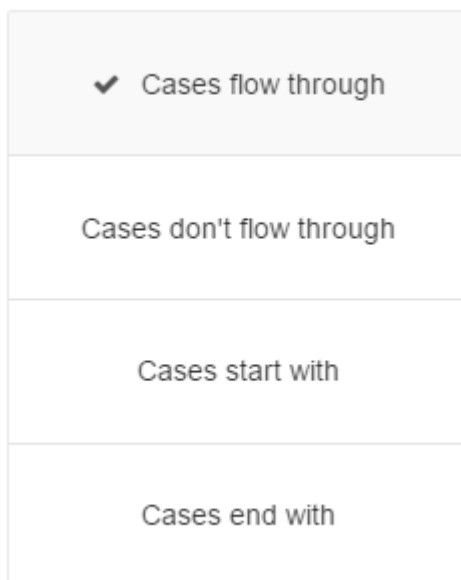
Search by name
Adjustment Charge
Block Purchase Order Item
Cancel Goods Receipt
Cancel Invoice Receipt
Change Currency
Change PR Approval

Click on any activity to select it.

The search field might help you to find your desired activity.

Relation Selection

In the next step, we need to set a relation.



A screenshot of a relation selection dropdown menu. It contains four options, each in a separate row. The first option, "Cases flow through", is selected and has a checkmark icon to its left. The other options are "Cases don't flow through", "Cases start with", and "Cases end with".

✓ Cases flow through
Cases don't flow through
Cases start with
Cases end with


The relation defines the condition, that a case needs to have to be added to the accumulated Activity selection, that is displayed in the Activity chart.

By default, *Cases flow through* is selected.

Activity chart

The Activity chart compares the component selection (based on the settings that have been made in the Activity selection and the Relation selection, see above) with all other available cases (which might be restricted by global [Selections](#)).



If you wish to apply a global [selection](#) based on this selection, use the small  icon in the upper right part of the activity chart.

AE: Settings

The following settings are available for the activity explorer:

Activity Search

Title

Metrics Case count ▼

BORDER OPTIONS

☒ Show Border

Thickness Style Color

Opacity 100%

BACKGROUND OPTIONS

☐ Show background

CHART OPTIONS

Text color Pick color...

Series color Pick color...

OTHER OPTIONS

☐ Component is not filtered with selections

Done

▼ Title

Type your desired title into the text field.

When a title is set, its formatting option will be shown. Font, size, color and alignment can be defined.

Title

TITLE FORMATTING

Font Size

▼ Metrics

You can display the relation in the activity chart either as a decimal number (*case count*) or as a percentage value (*percentage*).

Metrics

BORDER OPTIONS

By default, *Case count* is selected.

▼ Border Options

Activate the *Show Border* checkbox to surround your explorer with a border.

You can specify the thickness, style, color and opacity of the borderline.

BORDER OPTIONS

☒ Show Border

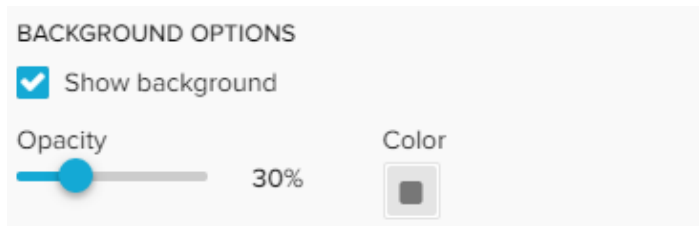
Thickness
 Style
 Color

Opacity

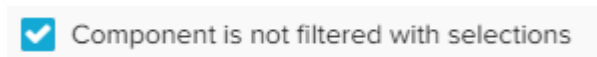
▼ Background Options

Set a background color for your activity explorer!

Activate the *Show background* checkbox, select a color and adjust the opacity.



If you don't want your explorer to be affected by *any* external [selection](#), activate the *Component is not filtered with selections* checkbox.



- one case.
- In a **purchasing process**, all actions of handling an order item can represent one case

A **Case_id** is the unique identifier which is solely given to the events belonging to one case.

4.3.3 CHARTS AND TABLES

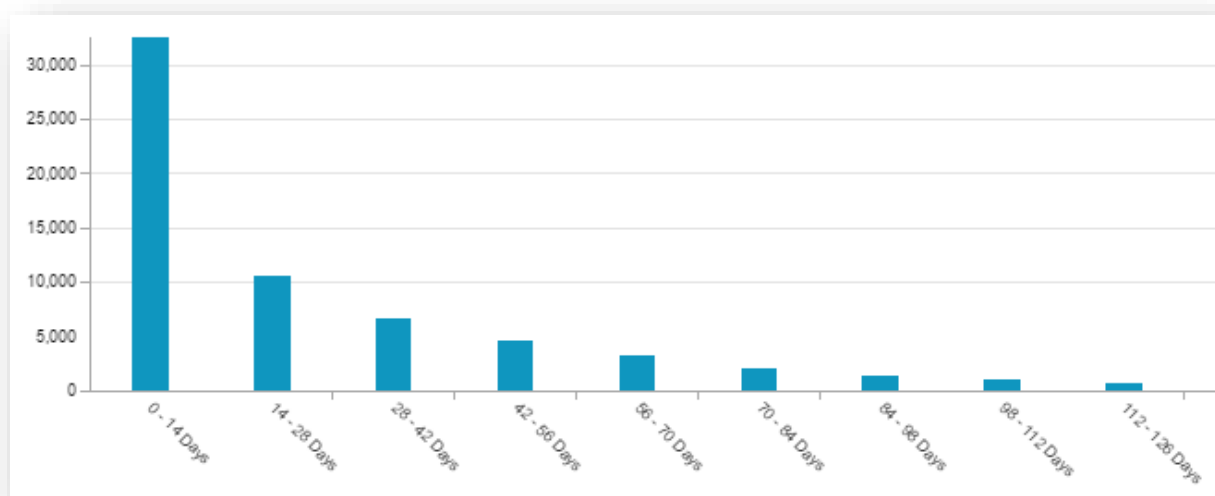
Charts and tables are used to illustrate certain data in an intuitive way.

The following components are available and explained on these subpages:

OLAP Table

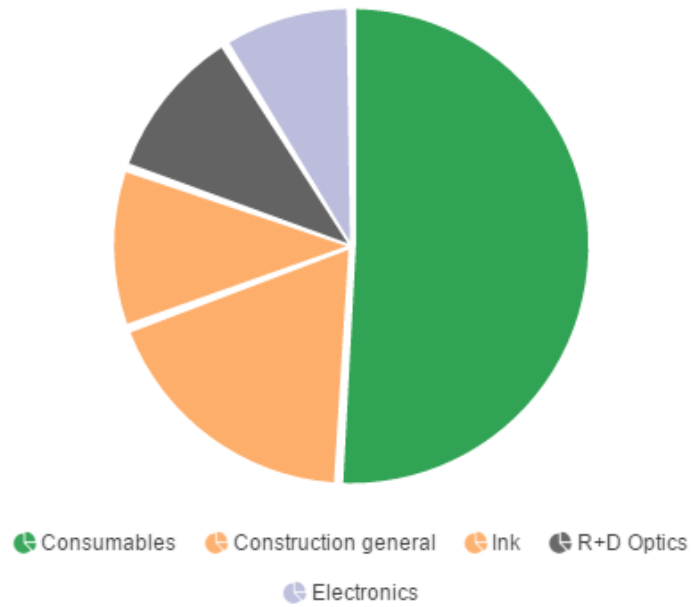
Purchase order items by Material			
Material	# PO items	# Changes	1
-	682	879	
R100002 - Salami parma	379	527	
R100001 - Fauna margarine	331	490	
R100000 - Yoghurt all natural	335	475	
R100004 - 'Sophia I.' pizza, 3-pack	313	438	

Column Chart



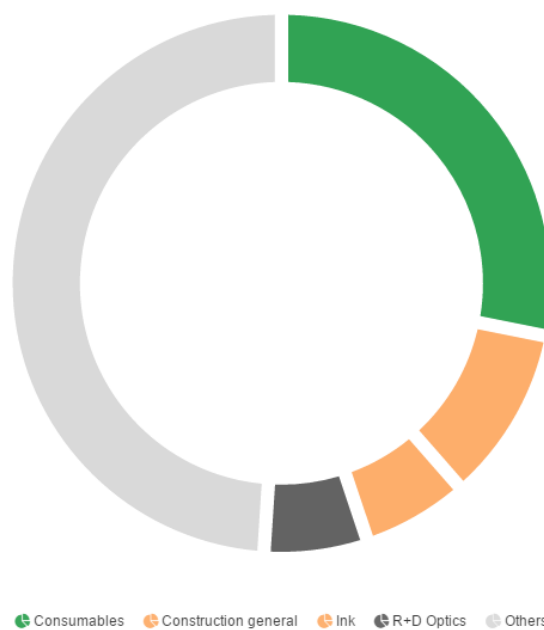
Pie chart

PO items by material group (top 5)

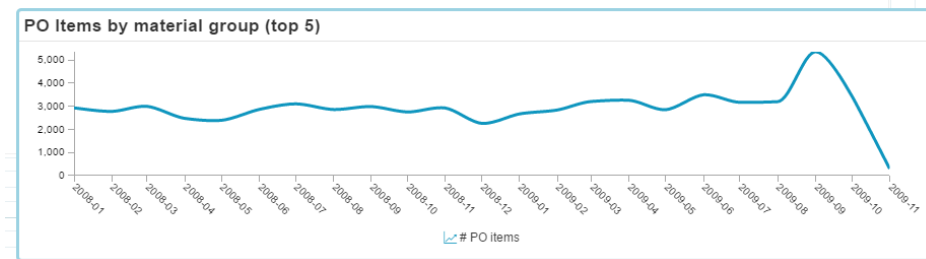


Donut Chart

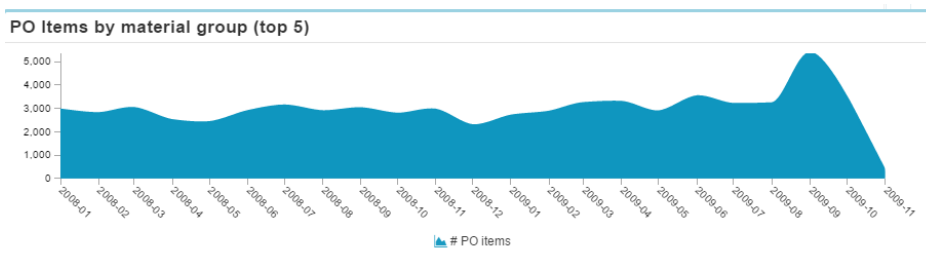
PO items by material group (top 5)



Line Chart



Area Chart



Scatter Plot



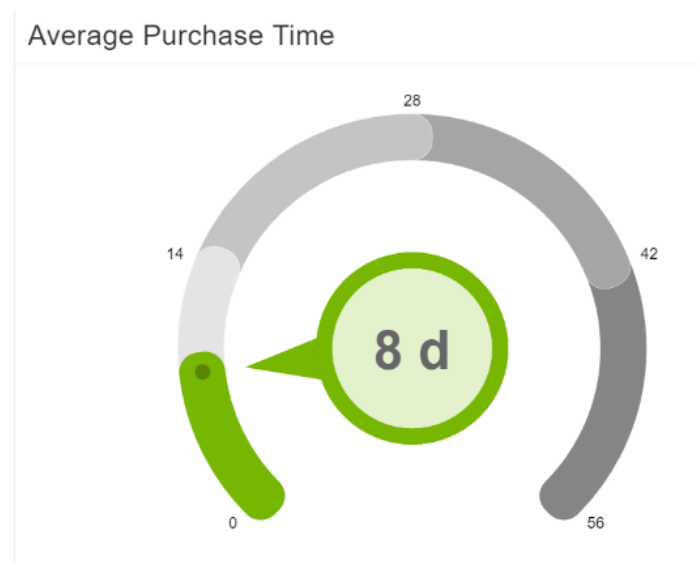
Bubble Plot



Histogram Chart



Single KPI



4.3.3.1 Configurations

As all components share functionality, you will find a detailed description of the most common configuration options in this section.

Please Note:

Different charts might still require special configuration options. For this reason, you won't find all the listed configuration options in all every chart configuration.

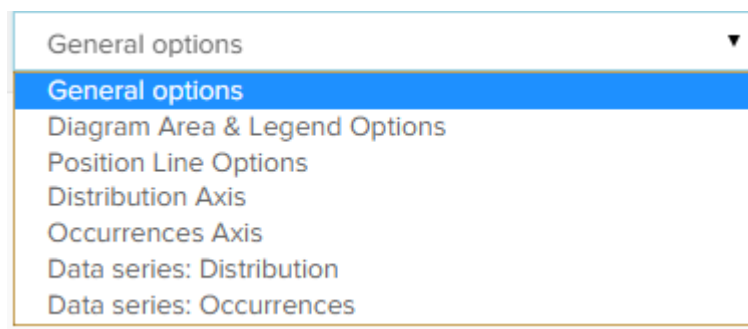
If you want to know more about a certain feature, this chapter and the following navigation will help you.

If you plan to configure your own component, we would recommend to refer to the corresponding chart chapter (start [here](#)).

In SAP Process Mining by Celonis 4.2, components offer a lot of configuration features.

To sort all options, the configuration options are structured into different configuration pages.

Open any component configuration, and use the dropdown menu at the top of the configuration section to switch to your desired configuration layer.



This screenshot is taken from the configuration of an empty [Histogram Chart](#).

For **charts and tables**, the following basic configuration categories are available and shared by all components (except for the [Single KPI](#)):

General Options

Area Options / Legend Options

Data Series

C&T: General Options

The General options include the most basic configuration operations for the initialization of the chart, as well as some basic layout options.

The screenshot shows the 'Component options' dialog box. It has a title bar with a close button. Below the title bar is a 'General options' section with a dropdown arrow. Under this, there is a 'Chart title' text field with an edit icon, a 'Component type' dropdown menu set to 'Pie Chart', and an 'Add' button. Below these are three sections: 'DIMENSIONS' with an 'Add' button, 'KPIS' with an 'Add' button, and 'SORTING' with an 'Add' button. Each of these three sections has a list area and icons for adding, removing, and sorting. At the bottom, there are two checked checkboxes: 'Legend' and 'Show tooltips'. A 'Done' button is at the bottom right.

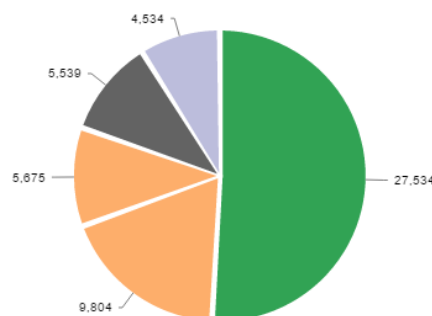
This is a screenshot of the general options for a [pie chart](#).

The general options offer the following options:

▼ Title

The title will appear above your component in the analysis sheet.

PO Items by material group (top 5)



Please specify your desired title into the text field.

Next to the text field, a small pencil icon () appears.

This will either open the [area options](#) or display the title configuration directly under the text field:

TITLE

PO Items by material group (top 5)

[Translate](#)

TITLE FORMATTING

Font

Sans serif

Size

x-large 17px

B

I

U

A

↺

□

≡

≡

≡

You may edit your font, its size, text highlighting, colors (font-, background - and border color) and your text orientation.

- Component type

As all [Charts And Tables](#) require [Dimensions & KPIs](#), you can most likely switch between components without altering your dimensions or KPIs.

The list of available components can be opened with this drop-down menu:

- Column Chart
- OLAP Table
- Column Chart**
- Pie Chart
- Donut Chart
- Line Chart
- Area Chart
- Scatter Plot
- Bubble Plot

Please Note

This feature requires similar configuration patterns across the component.

For this reason, it is **not** available for the following components:

- Histogram Chart
- Single KPI

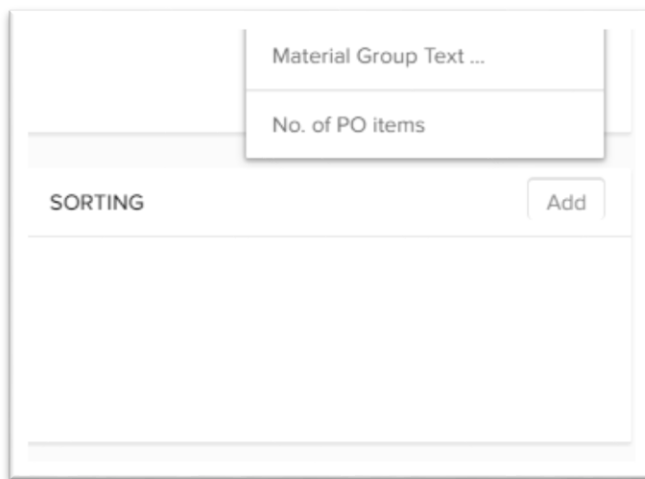
▼ Dimensions / KPIs


Use the [Formula Editor](#) to add dimensions and KPIs.

If you are not familiar with dimensions or KPIs, we strongly recommend to read the chapter [Dimensions & KPIs](#).

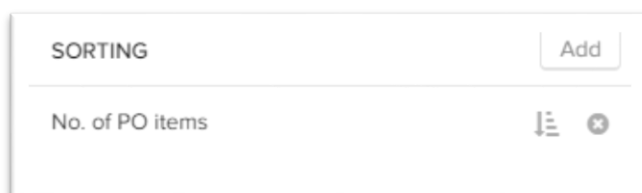
▼ Sorting

You can sort your component per any dimension / KPI that has been created for this component.



Click on the  button in the upper right corner of the sorting area to **define a new sorting rule**.

All dimensions and KPIs will show up. Click on any of those to define a new sorting rule.



The names are sourced in the title of the dimension or the KPI, you cannot edit titles in the sorting area.

Multiple Sorting


You can add as many sorting rules as you like.


The sorting rules are applied in a descending order, the sorting rule that is listed on top of all rules is the first sorting rule to be considered.

You can change the order of the sorting rules with Drag & Drop.

For each sorting rule, you can choose between **ascending / descending order**.

By default, an ascending sorting rule is applied.

Click on the small icon () next to the title to change it.

To **delete an existing sorting rule**, click on the small cross next to the title ().

▼ Advanced Options

This is a list of all advanced options.

Not all of them might be available in your chart.

▼ Distinct values

If you activate this option, the dimensions are selected distinct.

In our purchase material order this might be useful if you wish to display each material only once, without adding a KPI.

☐ Distinct

▼ Allow multiple columns sorting

Not only an Analyst but also a Viewer might want to apply sorting rules.

This is especially useful in [OLAP Tables](#).

If you check this option, Viewer can apply as many sorting rules as they like (for their session, these rules will not be saved to the component).

If you deactivate this option, Viewer can only apply one sorting rule (for one column).

☐ Allow multiple columns sorting

▼ Component is not filtered with selections

If you don't want your component to be affected by any external [selection](#), activate the *Component is not filtered with selections* checkbox.

☐ Component is not filtered with selections

▼ Disable Selections

By default, [Selections](#) can be applied by any viewer by choosing columns from the OLAP-Table. If you activate this option, this will no longer be possible for this component.

☐ Disable Selections


▼ Scroll horizontal

Use this option if you wish to display a horizontal scroll bar. When activated, it will be displayed if the content of the table exceeds the available space in the assigned component area.

☐ Scroll horizontal

▼ Legend

Activate this option to show the chart's legend.

☒ Legend 

To edit the legend, click on the small  icon.

This will open the [area options](#).

▼ Vertical

If a vertical checkbox is available, you can turn the whole chart by 90 degrees.

The chart bars will be displayed in a vertical direction, instead of a horizontal direction.

☐ Vertical

▼ Limit rows

Depending on your data model and your selected dimensions / KPIs, components might include too many entries, which decreases the legibility. If you wish to limit the rows (for example, only display the top 150 entries in a table or the top 5 entries for a chart), you can use this option.

First, we need to activate the limiter with the drop-down menu. Choose *Limit*:

Limit rows	Limit ▼
Elements shown	4

Now, enter a number in the *Number of Rows / Elements shown* field.

Sorting

This option only displays the *upper* rows. However, you can use Sorting rules (as described above) to bring up lower rows in the upper rows by altering the sorting rules.

▼ Show tooltips

Tooltips show details about the chart entry by hovering it in your chart area.

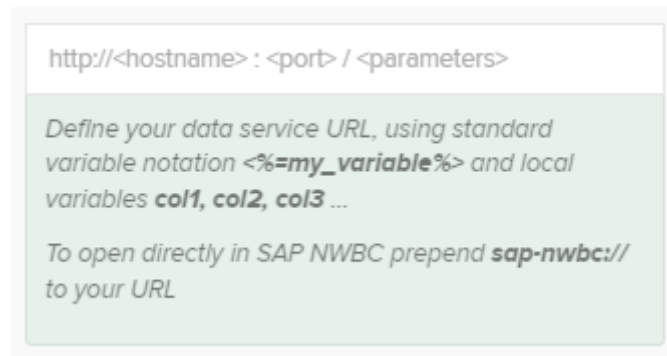
These include the relative percentage of the entry (calculated upon the displayed entries), your selected dimension attribute and (absolute) KPI value.

Don't forget to save your settings with

Done


▼ Data Service Link

The data service link allows it to open an URL from an OLAP table. Additionally it is also possible to parse values from the table to the URL and thereby reuse data from the analysis:



To parse values with the URL the following syntax is used: **<%=col1%>** Here it would insert the value of the first column:

Sample1	Sample2
example1 	1234500%

The example: www.test.com/<%=col1%> will open the URL www.test.com/example1 when clicking on  in the OLAP table. In the same way values from column 2, column 3, etc. can be parsed using the syntax: **<%=col2%>**, **<%=col3%>**, etc.

C&T: Area Options

The Area Options offer configurations to adjust the layout of your component area and its legend.

Area Options / Legend Options

The Area Options are labelled differently for some components in the charts and tables section.

For a [OLAP Table](#), these options are called **Table Area Options**, for any charts these options are called **Diagram Area & Legend Options**.

Component options

Diagram Area & Legend Options

TITLE

Purchase Orders [Translate](#)

TITLE FORMATTING

Font: Sans serif Size: x-large 17px

B *I* U A [color icon] [background icon] [list icon]

BORDER OPTIONS

☐ Show Border

BACKGROUND OPTIONS

☐ Show background

LEGEND

☐ Show legend

Done

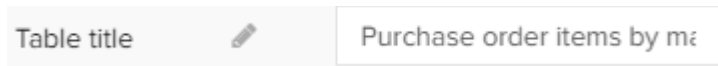
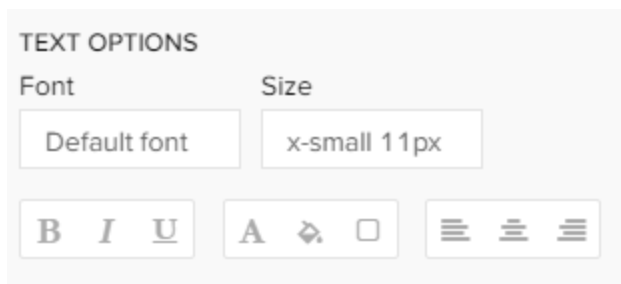
This is a screenshot from the Area Options of a chart.

The following options are available:

▼ Title

Type your desired title into the text field.

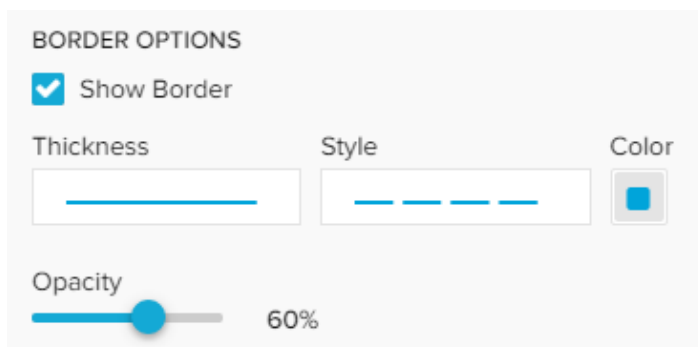
When a title is set, its formatting option will be shown. Font, size, color and alignment can be defined.

▼ Border Options

Activate the *Show Border* checkbox to surround your chart with a border.

You can specify the thickness, style, color and opacity of the borderline.



▼ Background Options

Set a background color for your chart!

Activate the *Show background* checkbox, select a color and adjust the opacity.

BACKGROUND OPTIONS

☒ Show background

Opacity

 30%

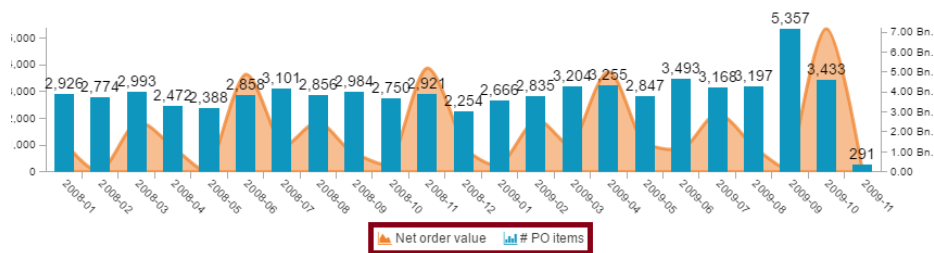
Color

Legend

Activate the *Show legend* option to display a legend in your chart area.

☒ Show legend

By default, the legend will show up below your chart.



You can however change the legend's position in the *Legend position* section:

Legend position

☐

☐

☐

☐

☐

☒

☐

If the addition of the legend escapes the available space for your chart in the analysis sheet, you can use the *Overlay legend* option.

☐ Overlay legend

Instead of decreasing the chart's size, the legend will now overlap the axis or the chart area itself to fit its assigned position.

Please Note:

Don't forget that *Overlay legend* might harm the legibility of the chart.

To format your legend, *Legend Formatting* offers you several options:

You can alter the default font, size, highlighting, color, background color and the border color.

▼ Text Options

OLAP Table only:

This section is only available for [OLAP Tables](#).

You can define a format for your table content, using the following formatting options:

You can set a font, a text size, change the color, border, background, set a text alignment and text highlighting.

Done

Don't forget to save your settings with

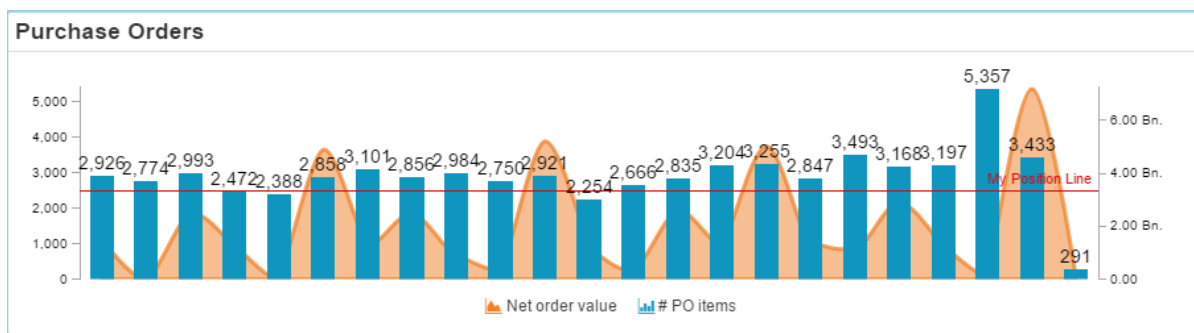
C&T: Position Line

Please Note

The following options are only available for charts, that offer linear axis:

- [Column Chart](#)
- [Line Chart](#)
- [Area Chart](#)
- [Scatter plot](#)
- [Bubble plot](#)

The Position line is a useful opportunity to offer a comparison to a certain KPI at first glance.



The following options are available:

Component options

Position Line Options

MY POSITION LINE

Label

My Position Line

Axis

Primary Axis

Formula

Label Position

right

Thickness

Style

Color

Opacity

100%

☐ Display value in label

New position line

Done

The following options are available:

▼ Label

You can (optionally) label your position line.

Label

My Position Line

The name will show up above your position line.

You can specify the exact position with *Label Position*.

▼ Axis

If you activated a [secondary axis](#) for this chart, you can choose the reference for the position line function in this field. Choose between primary axis and secondary axis.

Axis

Primary Axis ▼

Formula

Primary Axis

Secondary Axis

Please Note

If you have not activated a secondary axis, this field will be hidden.

▼ Formula

The position line is a function, that is based on the selected axis.

You can either enter a fixed value (e.g. 3000) or insert a [PQL statement](#).

Formula

avg("EKPO"."NETWR")

Changes to the Formula will be applied immediately.

▼ Label Position

If you have set a label, you can specify its position on the position line with the *Label Position*.

You can choose between left, centre and right with the dropdown menu.

Label Position right ▼

▼ Format and Opacity

You may adjust the thickness, style and color of your position line, as well as its opacity.

Thickness Style Color

Opacity 100%

▼ Display value in label

With this checkbox, you can extend the title in the chart by the estimated value of your formula.

☐ Display value in label

Multiple Position Lines

You can add an unlimited amount of position lines to your graph.

New position line

To add another position line, use the line options.

button, that is located at the bottom of the position

C&T: Dimension Axis

Please Note

The following options are only available for charts, that offer linear axis:

- [Column Chart](#)
- [Line Chart](#)
- [Area Chart](#)
- [Scatter plot](#)
- [Bubble plot](#)

Dimension Axis represent the x-axis of your chart.

The following configuration options are available:

Component options [X]

Dimension Axis [v]

AXIS

☒ Display axis

Thickness [input] Style [input] Color [input]

Opacity [slider] 100%

AXIS TITLE

☐ Display axis title

AXIS LABELS

☒ Display axis labels

Font [Default font] Size [Choose size] Alignment [Auto Adju v]

[B I U] [A] [input] [input] [input] [input] [input]

GRIDLINES

☐ Show Gridlines

TICKS

☒ Display tick lines

BAR DISTANCE

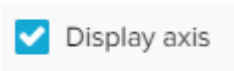
Series overlap [slider] 48%

Gap width [slider] 43%

Done

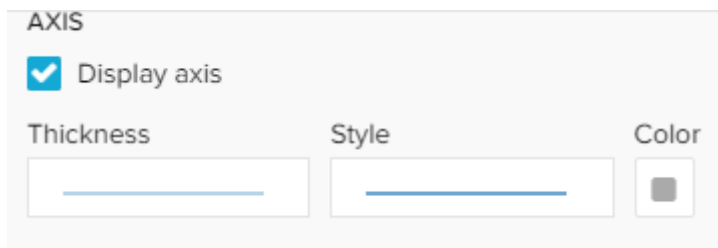
▼ Axis

The *Display axis* checkbox activates the axis, it will be visible next to your chart.



By default, this checkbox is set and your dimension axis is visible. You can now go ahead to configure your axis.

Feel free to alter the style, thickness, color, and opacity of your axis.



▼ Axis title

You can label your axis by activating the *Display axis title* checkbox.

This will display a label next to your axis:



After activating the checkbox, you can enter a title in the *Axis title* text field.

AXIS TITLE

☒ Display axis title

Axis title

Font Size Alignment

Furthermore, you will find a variety of format options, to adjust your font, its size, highlight, color and alignment.

▼ Axis Labels

Axis labels are the units of your axis. To configure the values, please refer to the [data series](#) section.

To show axis labels, activate the *Display axis labels* checkbox, which will introduce you to the following format options:

AXIS LABELS

☒ Display axis labels

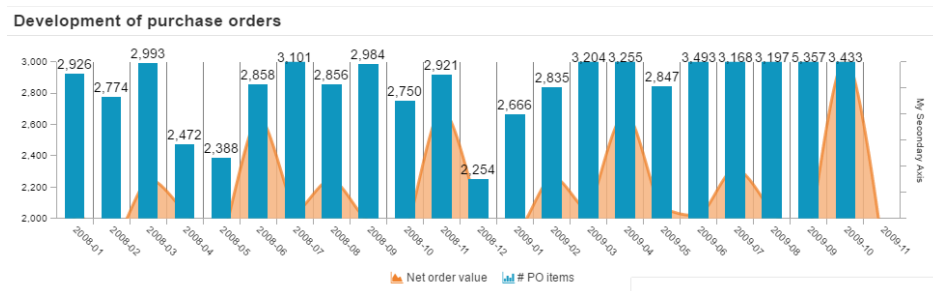
Font Size Alignment

Use these options to alter the label's font, its size, highlight, color and alignment.

All changes will be applied to the whole axis with all included labels.

▼ Gridlines

Dimension axis gridlines are **vertical** lines that are visible in your graph.



For each axis label (either if they are visible or not, see above), a gridline is displayed after activating the *Show Gridlines* checkbox.

GRIDLINES

☒ Show Gridlines

Thickness

Style

Color

Opacity

After you activated the gridlines, you can adjust the style, thickness, color and opacity of all lines.

Range

By default, the value axis try to cover all values, starting at 0 (*Auto-range*).

However, you can focus your graph on a specific range, by activating the *Manual-range* checkbox:

RANGE

☐ Auto-range ☒ Manual-range

From

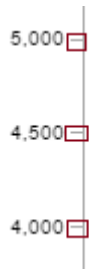
To

Please note however, that a range only applies for the axis, that you apply this range on.

If you use a secondary value axis, it won't be affected.

▼ Ticks

Ticks are small, horizontal label lines that are displayed between your value axis and its labels:



By default, ticks are enabled and thus visible in your graph for all axis.

☒ Display tick lines

To hide the tick lines, deactivate the *Display tick lines* checkbox.

By disabling *Auto-tick count* you can enter a number. Only this number (if greater than 0) of ticks and labels will be visible on your axis.

☒ Auto-tick count

Please note, that this does also affect your gridlines.

C&T: Primary Value Axis

Please Note

The following options are only available for charts, that offer linear axis:

- [Column Chart](#)
- [Line Chart](#)
- [Area Chart](#)
- [Scatter plot](#)
- [Bubble plot](#)

The **primary value axis** is the ("main") y-axis in your graph. It will most likely be displayed on the left side of your chart.

The screenshot shows the 'Component options' dialog for the 'Primary Value Axis'. The dialog is titled 'Component options' with a close button (X) in the top right corner. Below the title bar, there is a dropdown menu showing 'Primary Value Axis'. The main content area is divided into several sections:

- AXIS**: Contains a checked checkbox for 'Display axis'. Below it are three input fields: 'Thickness' (with a slider), 'Style' (with a dropdown), and 'Color' (with a color picker).
- Opacity**: A slider set to 100%.
- AXIS TITLE**: A checkbox for 'Display axis title' which is unchecked.
- AXIS LABELS**: A checked checkbox for 'Display axis labels'. Below it are three input fields: 'Font' (with a dropdown set to 'Default font'), 'Size' (with a dropdown set to 'Choose size'), and 'Alignment' (with a dropdown set to 'Auto Adju').
- GRIDLINES**: A checkbox for 'Show Gridlines' which is unchecked.
- RANGE**: Two radio buttons: 'Auto-range' (selected) and 'Manual-range'.
- TICKS**: Two checked checkboxes: 'Display tick lines' and 'Auto-tick count'.

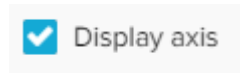
At the bottom right of the dialog is a blue 'Done' button.

This screenshot shows the Primary Value Axis configuration for a Column Chart.

The following options are available:

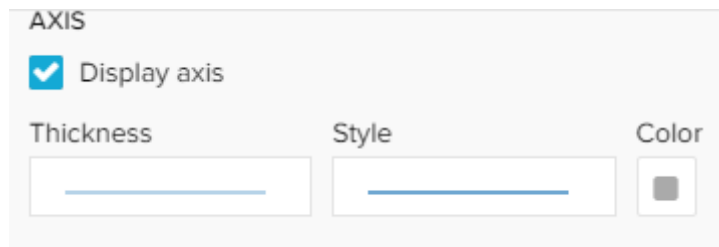
▼ Axis

The *Display axis* checkbox activates the axis, it will be visible next to your chart.



By default, this checkbox is set and your axis is visible. You can now go ahead to configure your axis.

Feel free to alter the style, thickness, color, and opacity of your axis.



▼ Axis title

You can label your axis by activating the *Display axis title* checkbox.

This will display a label next to your axis:



After activating the checkbox, you can enter a title in the *Axis title* text field.

Furthermore, you will find a variety of format options, to adjust your font, its size, highlight, color and alignment.

▼ Axis Labels

Axis labels are the units of your axis. To configure the values, please refer to the [data series](#) section.

To show axis labels, activate the *Display axis labels* checkbox, which will introduce you to the following format options:

AXIS LABELS

☒ Display axis labels

Font

Size

Alignment

Default font

Choose size

Auto Adju ▼

B I U

A ↗ □

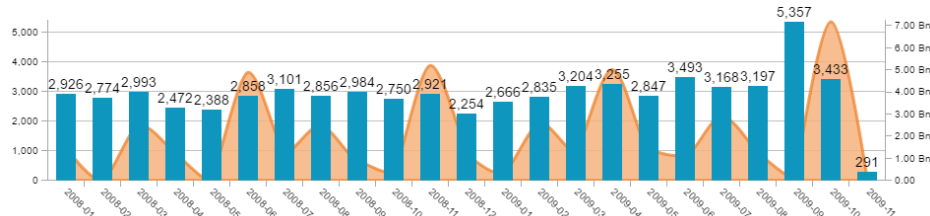
≡ ≡ ≡

Use these options to alter the label's font, its size, highlight, color and alignment.

All changes will be applied to the whole axis with all included labels.

Gridlines

Value axis gridlines are **horizontal** lines that are visible in your graph.



For each axis label (either if they are visible or not, see above), a gridline is displayed after activating the *Show Gridlines* checkbox.

GRIDLINES

☒ Show Gridlines

Thickness

Style

Color

Opacity

100%

After you activated the gridlines, you can adjust the style, thickness, color and opacity of all lines.

▼ Range

By default, the value axis try to cover all values, starting at 0 (*Auto-range*).

However, you can focus your graph on a specific range, by activating the *Manual-range* checkbox:

RANGE

☐ Auto-range ☒ Manual-range

From

To

Please note however, that a range only applies for the axis, that you apply this range on. If you use a secondary value axis, it won't be affected.

▼ Ticks

Ticks are small, horizontal label lines that are displayed between your value axis and its labels:



By default, ticks are enabled and thus visible in your graph for all axis.

☒ Display tick lines

To hide the tick lines, deactivate the *Display tick lines* checkbox.

By disabling *Auto-tick count* you can enter a number. Only this number (if greater than 0) of ticks and labels will be visible on your axis.

☒ Auto-tick count

Please note, that this does also affect your gridlines.

C&T: Secondary Value Axis

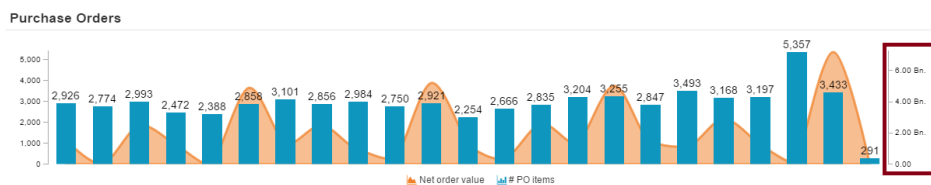
Please Note

The following options are only available for charts, that offer linear axis:

- [Column Chart](#)
- [Line Chart](#)
- [Area Chart](#)
- [Scatter plot](#)
- [Bubble plot](#)

The **secondary value axis** is the (optional second) y-axis of your graph, which will be displayed on the right side of your chart.

A secondary value axis can be useful, if you wish to compare two dimensions in one chart.



The above chart gives the Viewer a direct overview of the Net order values, compared to the number of Purchase Orders.

In this case, the number of order items (*#PO items*) is displayed on the secondary value axis.

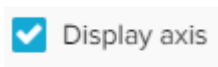
The configuration of the secondary value axis is pretty similar to the configuration of the [Primary Value Axis](#).

This is a sample configuration of a Colum chart with a secondary value axis.

The following options are available:

▼ Axis

The *Display axis* checkbox activates the axis, it will be visible next to your chart.



After activating the checkbox, you can specify the format of your axis line.
Feel free to alter the style, thickness, color, and opacity of your axis.

▼ Axis title

You can label your axis by activating the *Display axis title* checkbox. This will display a label next to your axis:

After activating the checkbox, you can enter a title in the *Axis title* text field.

Furthermore, you will find a variety of format options, to adjust your font, its size, highlight, color and alignment. ▼ Axis Labels

Axis labels are the units of your axis. To configure the values, please refer to the [data series](#) section.

To show axis labels, activate the *Display axis labels* checkbox, which will introduce you to the following format options:

Use these options to alter the label's font, its size, highlight, color and alignment.

All changes will be applied to the whole axis with all included labels.

▼ Gridlines

Value axis gridlines are **horizontal** lines that are visible in your graph.

For each axis label (either if they are visible or not, see above), a gridline is displayed after activating the *Show Gridlines* checkbox.

After you activated the gridlines, you can adjust the style, thickness, color and opacity of all lines.

▼ Range

By default, the value axis try to cover all values, starting at 0 (*Auto-range*).

However, you can focus your graph on a specific range, by activating the *Manual-range* checkbox:

RANGE

☐ Auto-range
 ☒ Manual-range

From

To

Please note however, that a range only applies for the axis, that you apply this range on. The primary value axis won't be affected.

▼ Ticks

Ticks are small, horizontal label lines that are displayed between your value axis and its labels:



By default, ticks are enabled and thus visible in your graph for all axis. To hide the tick lines, deactivate the *Display tick lines* checkbox.

☒ Display tick lines

By disabling *Auto-tick count* you can enter a number. Only this number (if greater than 0) of ticks and labels will be visible on your axis.

☒ Auto-tick count

Please note, that this does also affect your gridlines.

C&T: Data Series

A data series section is set up for every dimension and KPI that has been created in your component (also see [general options](#)).

It offers options that are available in the [Formula Editor](#).

The Data Series configurations differ a lot for different components.

For this reason, we strongly recommend to conduct the component's chapter, to know which options are available and relevant for a successful configuration.


The screenshot shows a 'Component options' dialog box with the following sections:

- Data series:** A dropdown menu showing 'Month(Last Changed on ["EKPO":"AEDAT"])'.
- DATA SERIES OPTIONS**
 - Series name:** A text field containing 'Month(Last Changed on ["EKPO":"AEDAT"])' with a 'Translate' link to its right.
 - Formula:** A text field containing 'ROUND_MONTH(["EKPO", "AEDAT"])' with a formula icon to its right.
- FORMATTING**
 - Predefined formats:** A dropdown menu showing 'Date:year-month (Y-'.
 - Formatting formula:** A text field containing '%Y-%m' with a 'Documentation' link to its right.
 - Units:** An empty text field.
- Buttons:** A 'Done' button at the bottom right.

This screenshot shows the Data Series options that are available for all components.

▼ Data Series Options

At the top of this section, you may change the **Series name**. This is the name that is displayed in the dimension section, the KPI section and the sorting section in the [general options](#).

Furthermore, you can alter the KPI statement. Click on the small icon () on the right corner to edit the statement in the [Formula Editor](#).

Please refer to the [Dimensions & KPIs](#) chapter for further explanations.

▼ Formatting

In this section, you can alter your [Value Formatting](#).

The following option is only available for [OLAP Tables](#):

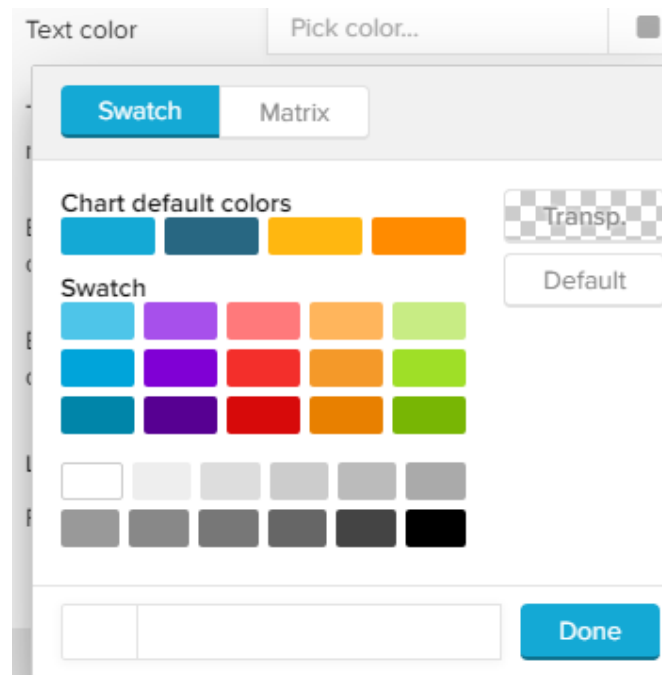
▼ Coloring Table

You can color the content of the table, as well as the background.

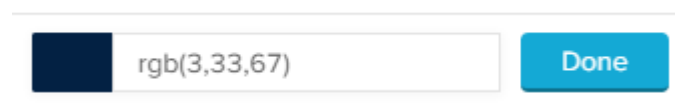
For both, you can either select a single color or apply a color mapping rule.

▼ Single color

If you wish to color the table's content or the background in the **same color**, pick a color in the *Text color* or the *Background color* field.



If you wish to insert a custom css color, you can use the field in the lower row.

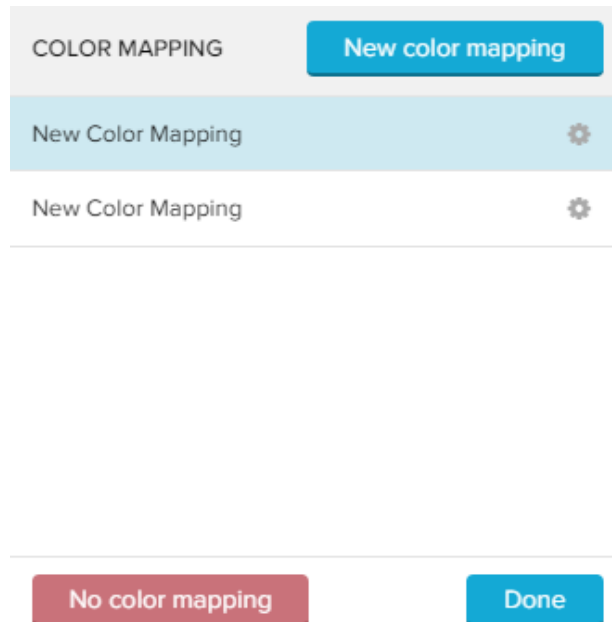


▼ Color mapping

This method allows text - or background coloring per different criteria.

For example, critical values can be highlighted with a different color.

Click on the small  icon to get started!



To add a new color mapping, click on  in the upper right corner.

The following **color mapping editor** will open:

First, let's give our new color mapping a **title** in the upper text-field.

You can furthermore choose coloring based on values of *Dimensions* or *Series* (which is selected by default). Dimension color rules will be applied on the dimensions; Series color rules will be applied to the KPIs.

We need to define **color thresholds**. For each threshold, we can specify a comparison function as well as the actual threshold value.

Let's examine the following example:

We want to color all materials which occur at least 2000 times blue, all materials occurring less than 200 times but more than 1000 times yellow, and all other materials (less than 1000) in black.

The following threshold settings need to be made:

Color mapping editor

name
My color mapping

Coloring based on values of
Series

Color thresholds

	if	Less than	1000	X
	if	Greater than/equal	1000	X
	if	Greater than/equal	2000	X

Add threshold

Delete Done

Sorting sequence

SAP Process Mining by Celonis 4.2 prioritizes color threshold settings which have been added recently.

To prevent any coloring overlaps, we strongly recommend to start with the lowest number of cases.

The following options are only available for charts, that offer linear axis:

- [Column Chart](#)
- [Line Chart](#)
- [Area Chart](#)
- [Scatter plot](#)
- [Bubble plot](#)

▼ Axis

You can display this data series either in your [primary value axis](#) or in your [secondary value axis](#) with the Axis dropdown menu.

Axis	Secondary Axis ▼
Alternative type	Primary Axis
	Secondary Axis

KPIs only

Please note, that this section is only available for KPIs, as dimensions are displayed in the x-axis.

▼ Coloring Area

KPIs only:

Please note, that this section is only available for KPIs, as dimensions are displayed in the x-axis.

You can color the graph (series color) with the following options:

COLORING AREA

Series color

#ef7d23

Series color mapping

Pick a color mapping...

▼

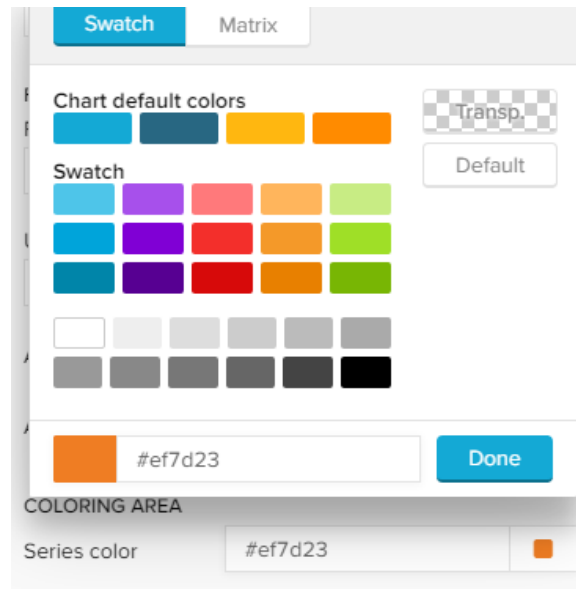
Opacity

71%

You can choose between a (single) series color, a series palette and a color mapping.

▼ Series color

If you wish to color your graph in **one single color**, pick a color in the *series color* field.



If you wish to insert a custom css color, you can use the field in the lower row.

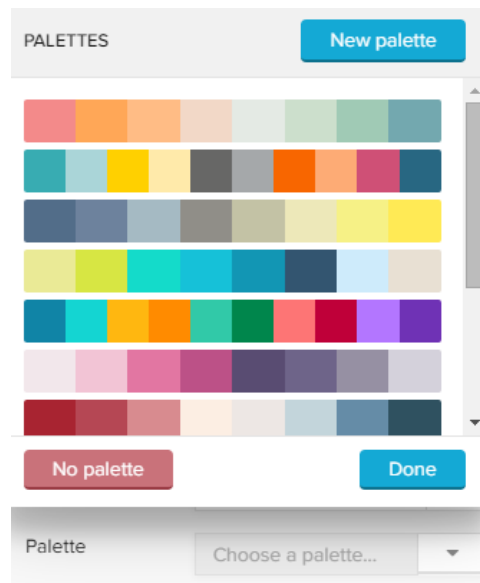


▼ Series palette

You can use a palette to color your graph in **different colors**.

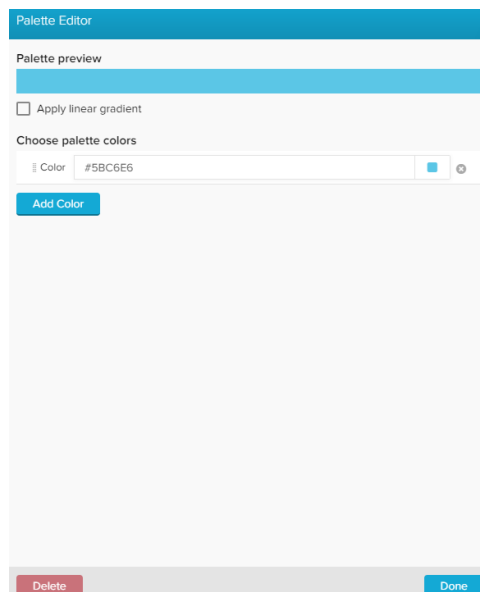
SAP Process Mining by Celonis 4.2 comes with a set of pre-defined palettes, which can be accessed with the small icon next to the *series palette* field.



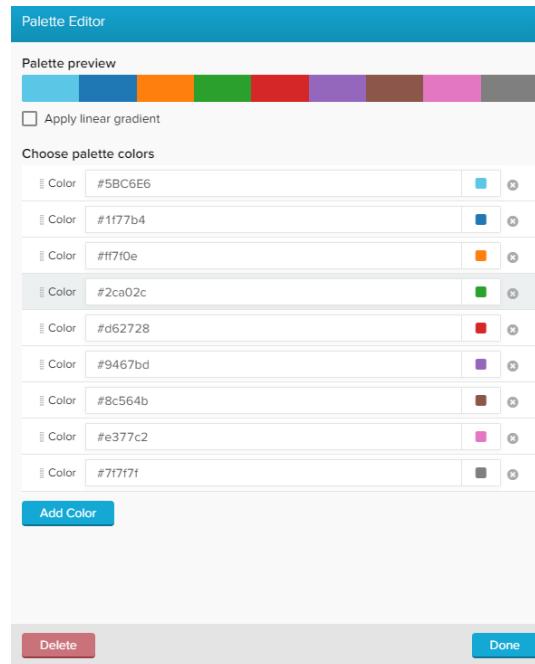


Choose any palette and click on *Done* or choose *New palette* to define a **custom palette**.

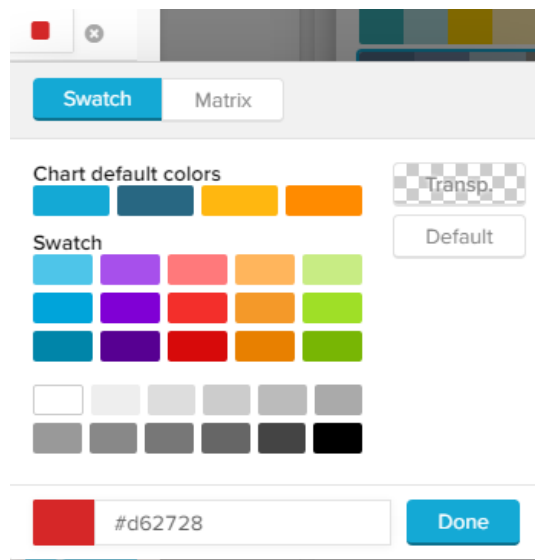
The palette editor will show up:




Click on  to add up to 20 colors!



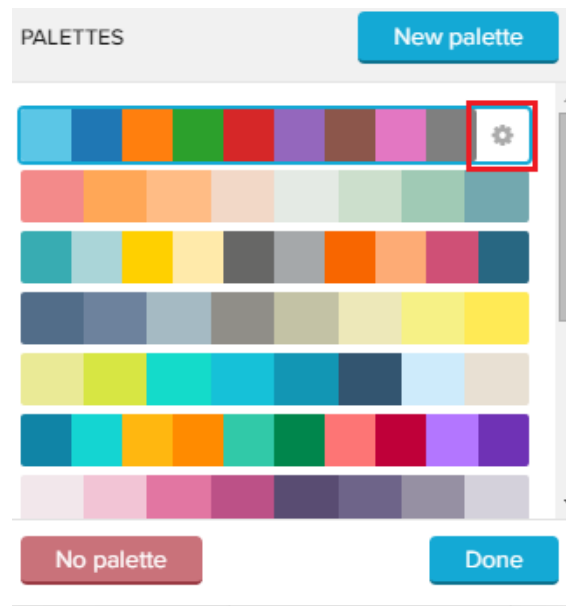
You can edit each color by clicking on the small colored square next to each color:



You can furthermore add a **linear gradient** to your palette. This will split your selected colors up into 20 gradient colors, which fade linear between two colors.

Don't forget to apply your palette with  .

Your new palette has now been added, and can be edited with the small icon next to your custom palette:



While editing a palette, you can **delete** it by clicking on

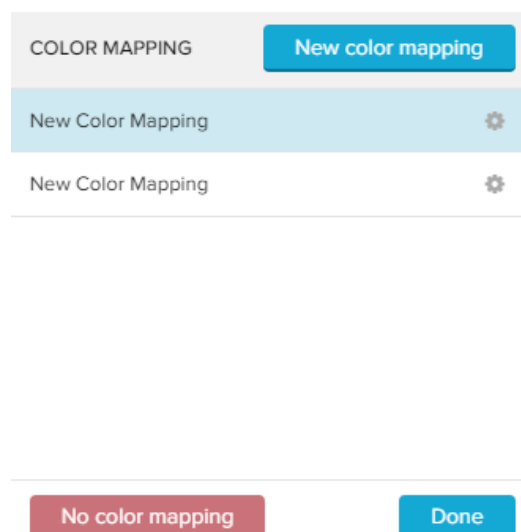
Delete

Series color mapping

This method allows (multiple) coloring per different criteria.

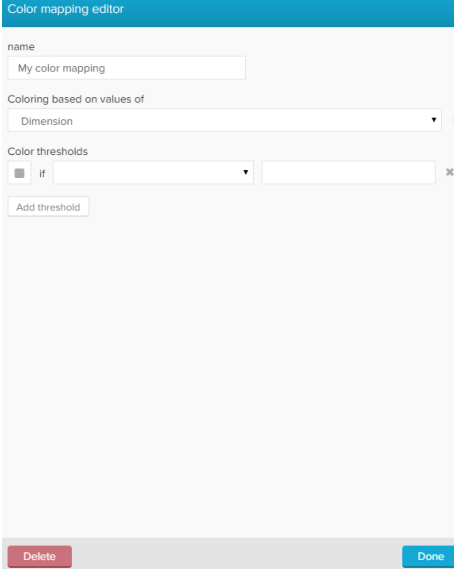
For example, critical values can be highlighted with a different color.

Click on the small  icon to get started!



To add a new color mapping, click on  in the upper right corner.

The following **color mapping editor** will open:



The image shows a 'Color mapping editor' dialog box. It has a title bar 'Color mapping editor'. Inside, there is a 'name' field with the text 'My color mapping'. Below it is a dropdown menu 'Coloring based on values of' with 'Dimension' selected. Underneath is a 'Color thresholds' section with a small square icon, the text 'if', a dropdown menu, and a text input field. There is an 'Add threshold' button below this section. At the bottom of the dialog are two buttons: 'Delete' (red) and 'Done' (blue).

First, let's give our new color mapping a **title** in the upper text-field.

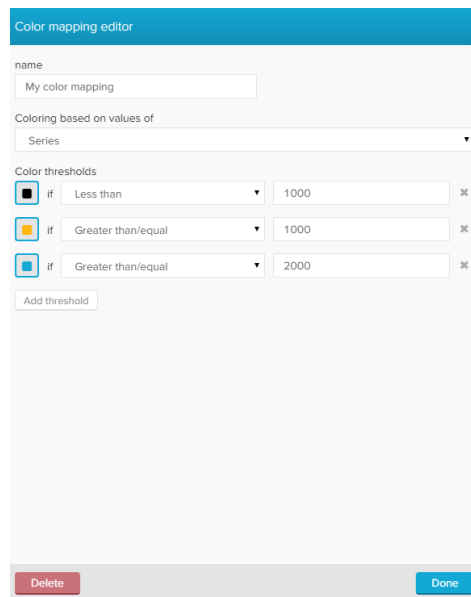
You can furthermore choose coloring based on values of *Dimensions* or *Series* (which is selected by default). Dimension color rules will be applied on the dimensions, Series color rules will be applied to the KPIs.

We need to define **color thresholds**. For each threshold, we can specify a comparison function as well as the actual threshold value.

Let's examine the following example:

In a P2P process, we want to color all materials which occur at least 2000 times blue, all materials occurring less than 200 times but more than 1000 times yellow, and all other materials (less than 1000) in black.

The following threshold settings need to be made:



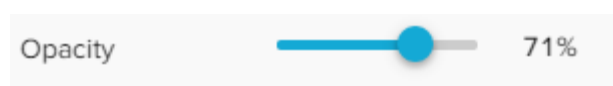
The image shows a 'Color mapping editor' window. It has a title bar 'Color mapping editor'. Below it is a 'name' field with the text 'My color mapping'. Then, 'Coloring based on values of' is followed by a dropdown menu showing 'Series'. Under 'Color thresholds', there are three rows. Each row starts with a color swatch (black, orange, and blue respectively), followed by 'if', a dropdown menu, and a text input field. The first row has 'Less than' in the dropdown and '1000' in the input field. The second row has 'Greater than/equal' in the dropdown and '1000' in the input field. The third row has 'Greater than/equal' in the dropdown and '2000' in the input field. Each row has a small 'x' icon to its right. Below the thresholds is an 'Add threshold' button. At the bottom are 'Delete' and 'Done' buttons.

Color	Condition	Value
Black	if Less than	1000
Orange	if Greater than/equal	1000
Blue	if Greater than/equal	2000

Sorting sequence

SAP Process Mining by Celonis 4.2 prioritizes color threshold settings which have been added recently. To prevent any coloring overlaps, we strongly recommend to start with the lowest number of cases.

To adjust the opacity of (any) color rule, you can use the opacity slider:



The image shows an 'Opacity' slider. It consists of a horizontal track with a blue circular handle. To the left of the track is the word 'Opacity' and to the right is '71%'. The slider is currently positioned at 71%.

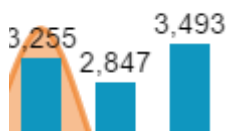
▼ Data labels

KPIs only

Please note, that this section is only available for KPIs.

To display the value of the data series above the bars in your graph, you can activate data labels with the checkbox *display data labels*.

☐ Display data labels



After activating the checkbox, you can adjust the position of the data labels with the dropdown - menu:

Label Position

- top ▼
- top
- middle
- bottom
- custom

Furthermore, you can format the labels with the known formatting options (font, size, alignment, highlight, color). The following options are only available for the following charts:

- [Area Chart](#)
- [Pie chart](#)

▼ Coloring Pie

KPIs only

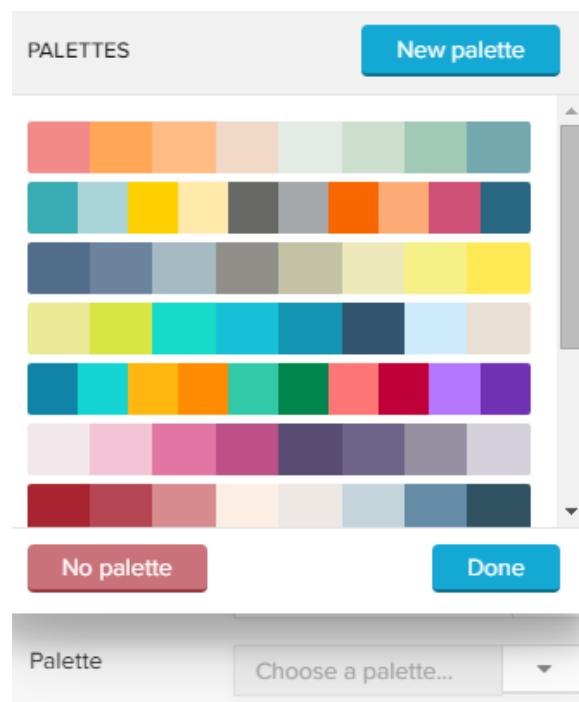
Please note, that this section is only available for KPIs, as they determine the relation of the chart entries.

You can choose between a (static) series palette and a color mapping.

▼ Series palette

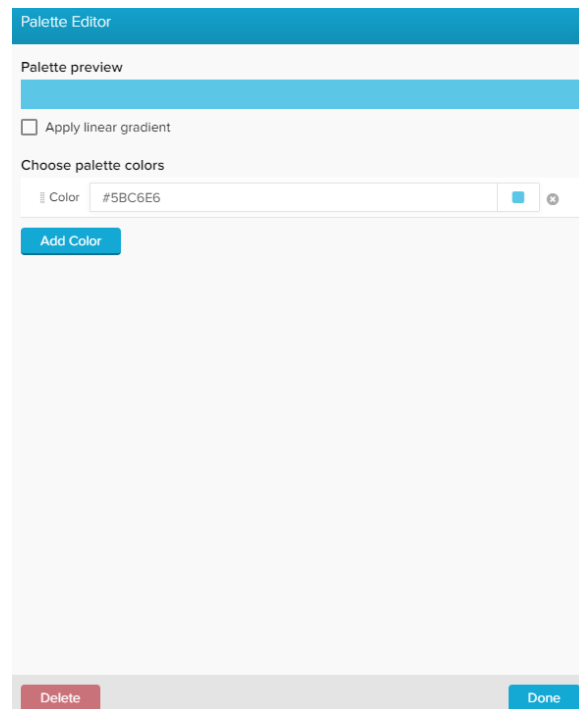
You can use a palette to color your graph in **different colors**.

SAP Process Mining by Celonis 4.2 comes with a set of pre-defined palettes, which can be accessed with the small icon next to the *series palette* field.

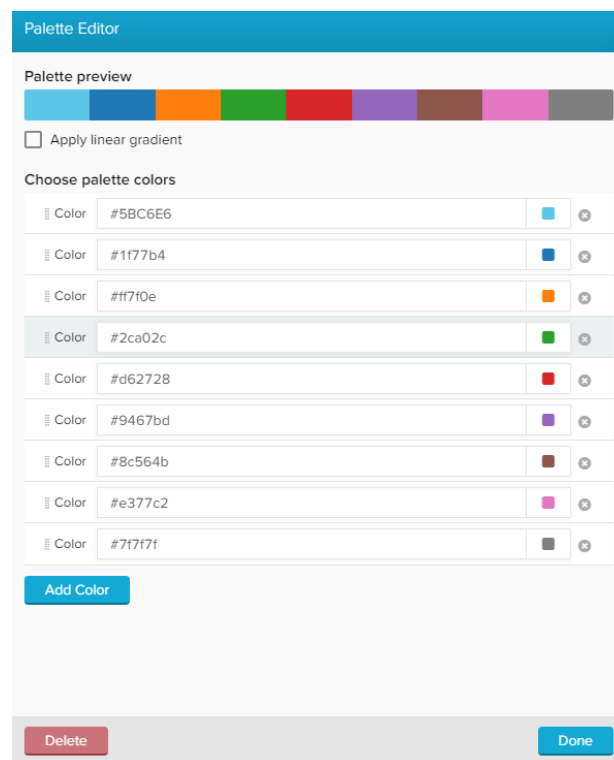


Choose any palette and click on *Done* or choose *New palette* to define a **custom palette**.

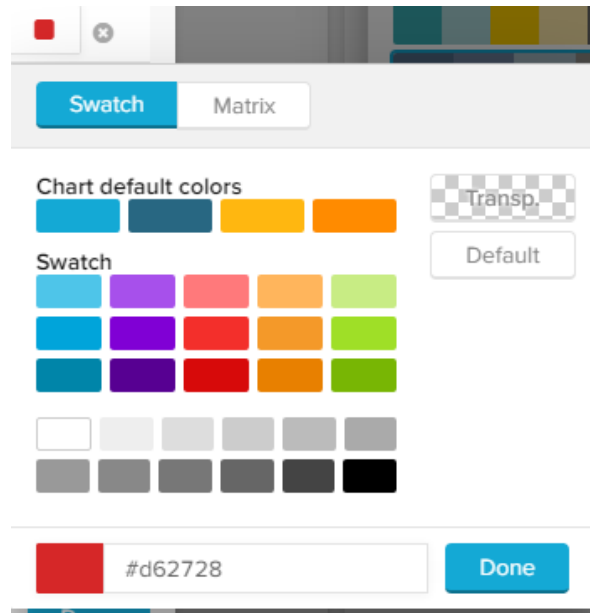
The palette editor will show up:




Click on  to add up to 20 colors!



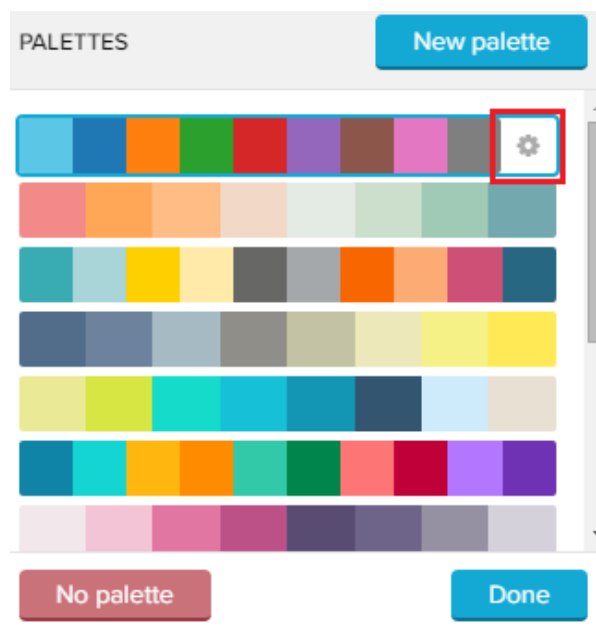
You can edit each color by clicking on the small colored square next to each color:



You can furthermore add a **linear gradient** to your palette. This will split your selected colors up into 20 gradient colors, which fade linear between two colors.

Don't forget to apply your palette with .

Your new palette has now been added, and can be edited with the small icon next to your custom palette:

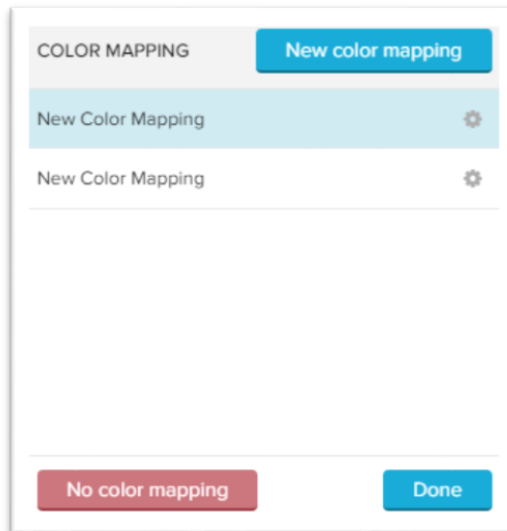


While editing a palette, you can **delete** it by clicking on .

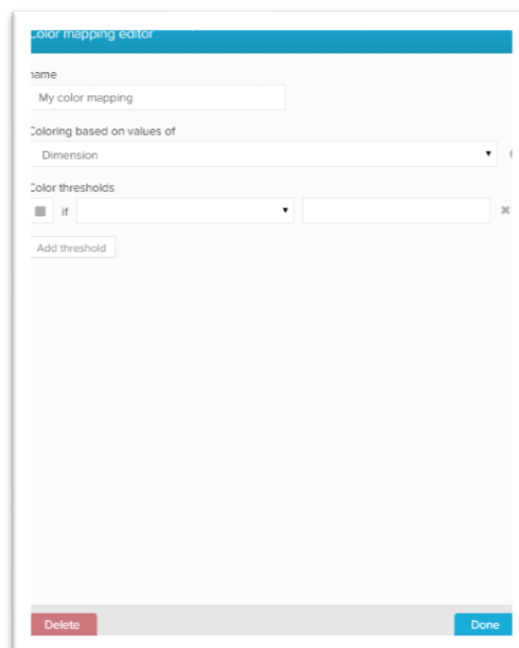
▼ Series color mapping

This method allows (multiple) coloring per different criteria. For example, critical values can be highlighted with a different color.

Click on the small  icon to get started!



To add a new color mapping, click on  in the upper right corner. The following **color mapping editor** will open:



First, let's give our new color mapping a **title** in the upper text-field. You can furthermore choose coloring based on values of *Dimensions* or *Series* (which is selected by default). Dimension color rules will be applied on the dimensions, Series color rules will be applied to the KPIs.

We need to define **color thresholds**. For each threshold, we can specify a comparison function as well as the actual threshold value.

Let's examine the following example:

In a P2P process, we want to color all materials per occurrence in the following way:

> 2000	Blue
< 2000 but >1000	Yellow
< 1000	Black

The following threshold settings need to be made:

Sorting sequence:

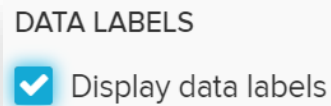
SAP Process Mining by Celonis 4.2 prioritizes color threshold settings which have been added recently. To prevent any coloring overlaps, we strongly recommend to start with the lowest number of cases.

To adjust the opacity of (any) color rule, you can use the opacity slider:

In the following, additional options are available:

▼ Show labels (values):

Activate this option to display value labels in your chart area.



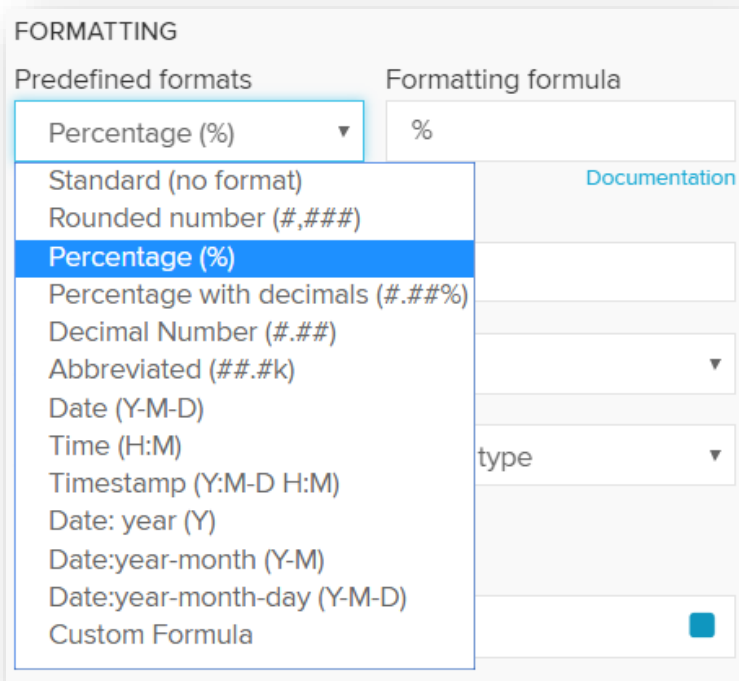
▼ Set count limit

This option requires visible labels! If you displayed a lot of entries in your chart area, you might only be interested in value labels for all entries above a certain threshold. With this option, you can set such a threshold.

Simply activate the *Set count limit* checkbox and enter your desired threshold in the text field.

▼ Show percentages

Activate this option to display the relative share of each entry (%) in your chart area.



4.3.3.2 OLAP Table

OLAP Tables are probably the simplest component of SAP Process Mining by Celonis 4.2. They consist of an indefinite number of columns that are either **dimensions** or **KPIs**. In OLAP-Tables, these dimensions are simple columns that influence the aggregation level of the KPI.

Each OLAP table requires at least one dimension. If no KPI is specified, the OLAP table will create a table row for each dimension.

The following OLAP table displays the purchase order items in a P2P-process, aggregated by material.

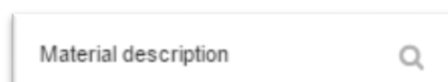
Material no.	Material description	# PO items	
-	-	2,396	
R100000	Yoghurt all natural	1,390	
R100002	Salami parma	1,373	
R100001	Fauna margarine	1,299	
R100004	'Sophia I' pizza, 3-pack	1,199	
R100014	Body lotion 'Alabaster'	1,176	
R100026	Meyer's cream of mushroom soup	1,134	
R100005	RAVIOLI 'LA MAMMA'	1,086	
R100010	Hammer, 20 oz framing	1,081	
R100013	Shampoo 'Splash'	1,076	
R100012	Skateboard 'Hells Bells'	1,055	
M-05	Flatscreen LE 50 P	1,055	
R100011	Basketball 'Professional'	1,051	
R100009	Screwdriver (cross-head)	1,041	
R100008	Pepper	1,031	
R100027	Meyer's oolash soup	1,018	


Demo-Data:

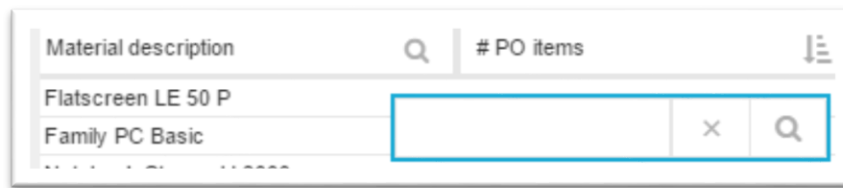
This example is included in the P2P - Demo Data, which can be included at the Single-User Installation. Furthermore, you can download a [transport](#) of the P2P - Demo Data **for free** on the [my.Celonis.de](#) platform.


Interaction with an OLAP Table

Viewer can interact with the table, and (if the Analyst has not deactivated this option), apply selections on any rows. When hovering a dimension column title, a small search icon will show up:



Click on the  icon to open a search field.



Furthermore, you can add sorting rules for every column. This can be done with a click next to the search field, which will bring up a sorting icon. 

To change the sorting order (descending/ascending), re-click it. By default, the column is sorted in a descending order. To deactivate the sorting rule, click on the small sorting icon again, until it disappears.

Configuration

The OLAP table follows the [Configurations](#).

The following configuration pages are available for every OLAP table:

General Options

- Title Settings
- Dimensions & KPIs
- Sorting
- Advanced Options

Table area options

- Title Settings
- Border Options
- Background Options
- Text Options

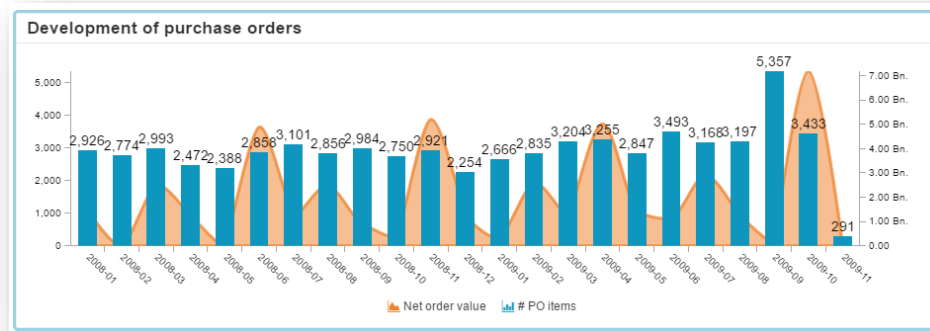
Data series

- Data Series Options
- Data Formatting
- Coloring

4.3.3.3 Column Chart

A Column Chart visualizes data on a two-dimensional scale using columns.

The [dimensions](#) can be columns or aggregations and the [KPIs](#) are typically frequencies or distributions.



Demo-Data:

This example is included in the P2P - Demo Data, which can be included at the Single-User Installation. Furthermore, you can download a [transport](#) of the P2P - Demo Data for free on the [my.Celonis.de](#) platform.

Configuration

The OLAP table follows the [Configurations](#).

The following configuration pages are available for every OLAP table:

[General options](#)

[Diagram Area & Legend Option](#)

[Position Line Options](#)

[Dimension Axis](#)

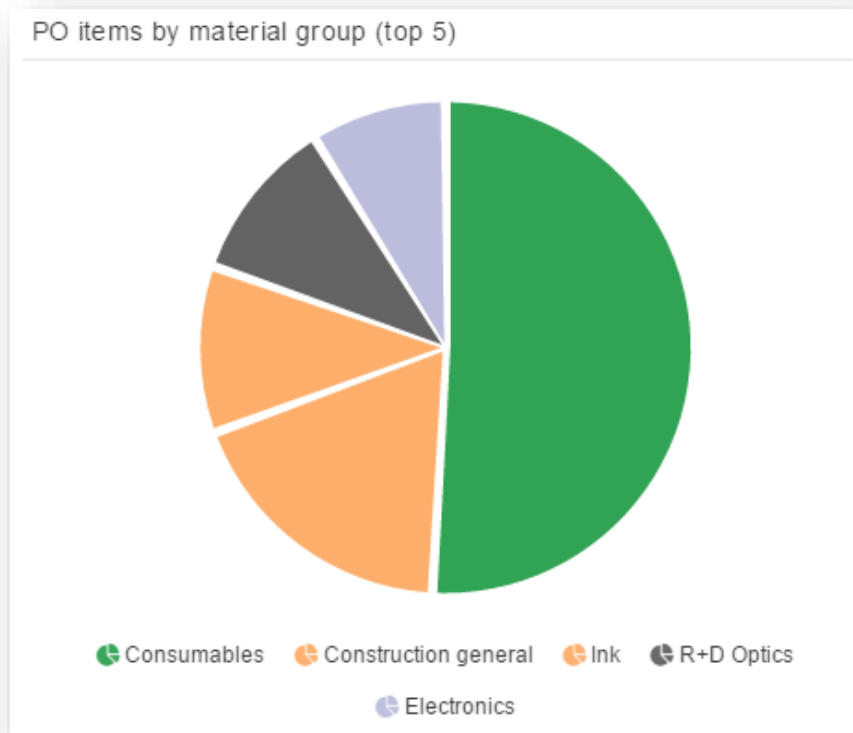
[Primary Value Axis](#)

[Secondary Value Axis](#)

[Data Series](#)

4.3.3.4 Pie chart

A pie chart illustrates numerical proportions of the underlying data in the well-known circle. The **dimensions** can be columns or aggregations and the **KPIs** are typically frequencies or distributions.



You can find all available configuration options in the following chapters.

Tip:

The displayed configuration in the following chapters matches the sample chart that is displayed above.

You can easily re-build it with these options and apply your own data.

Configuration

The following configuration categories are available:

General options

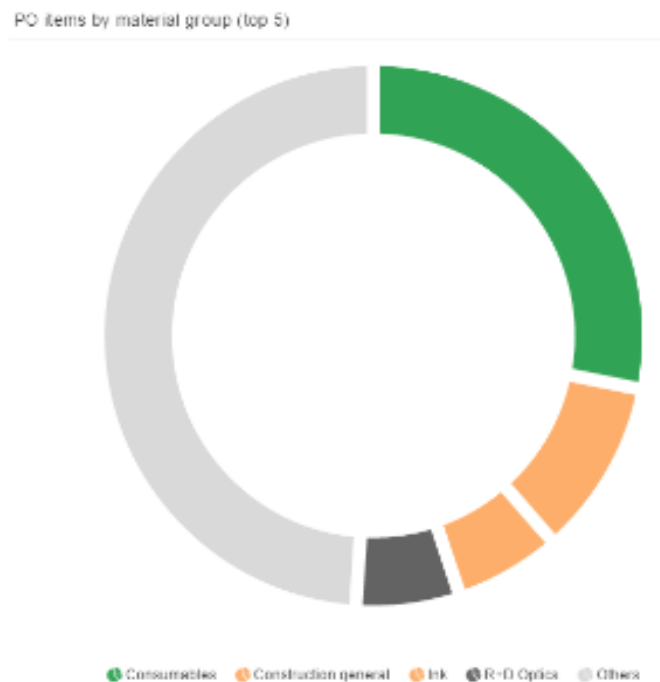
Area options

Data Series

4.3.3.5 Donut Chart

A donut chart is very similar to a [Pie chart](#).

It is based on numerical proportions of your dimensions and KPIs, however, only uses the border of the circle.



Configuration

The following configurations are offered by a Donut Chart:

General options

Area options

Data Series

4.3.3.6 Line Chart

Line Charts connect points illustrating the trend of your selected data over a specified dimension (e.g. time). This is a great way to illustrate your data flow over time.

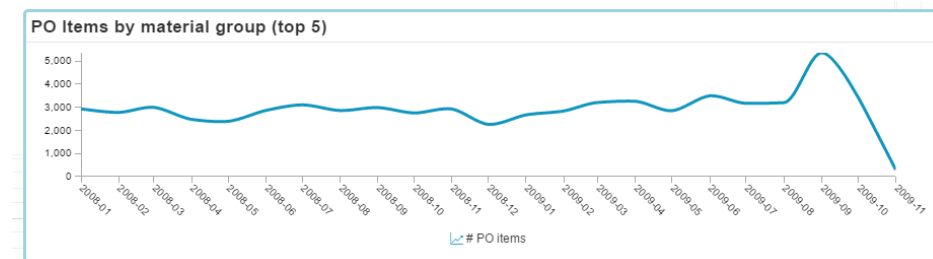


Chart Type:

It is very easy to convert charts (for example [Column Charts](#)) to a Line Chart diagram! Open the General Options of your "old" chart, and choose "Line Chart" at the *Component type* dropdown.

Configuration

In the Settings, you will recognize the following Configuration Options:

General options

Diagram Area & Legend
Options

Position Line Options

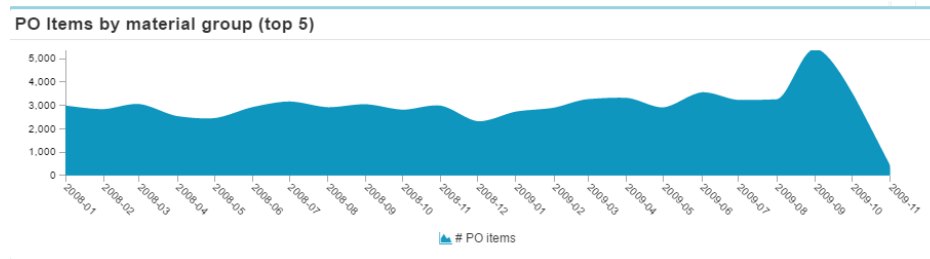
Dimension Axis

Primary Value Axis

Data Series

4.3.3.7 Area Chart

An Area Chart is very similar to the [Line Chart](#). It comes however with a filled-out space between the line and the dimension axis.



Configuration

The following configuration tabs are available:

General options

Diagram Area & Legend Options

Position Line Options

Dimension Axis

Primary Value Axis

Data Series

4.3.3.8 Scatter plot

A Scatter plot is another variation of a [Line Chart](#). Instead of a line, the values are therefore displayed as circles.

For analysing correlations between attributes, this is the component to choose! It allows you to choose one or two dimensions and one aggregation whose relationship will be displayed.



Configuration

The following configuration tabs are available in the component settings:

[General options](#)

[Diagram Area & Legend Options](#)

[Position Line Options](#)

[Dimension Axis](#)

[Primary Value Axis](#)

[Data Series](#)

4.3.3.9 Bubble plot

A Bubble plot is an extension of the [Scatter plot](#).

If a second aggregation is used, that aggregation will determine the size of the bubbles in the plot, which make the Bubble Plot more intuitively understandable.



Configuration

The following configuration tabs are available in the component settings:

General options

Diagram Area & Legend
Options

Position Line Options

Dimension Axis

Primary Value Axis

Data Series

4.3.3.10 Histogram Chart

A Histogram visualizes the distribution of a certain dimension, and is very similar to the well-known [Column Chart](#).

However, you can group your dimension into data sections, to (for example) filter them for quarterly results.



Configuration

The following configuration tabs are available in the component settings:

General options

Diagram Area & Legend Options

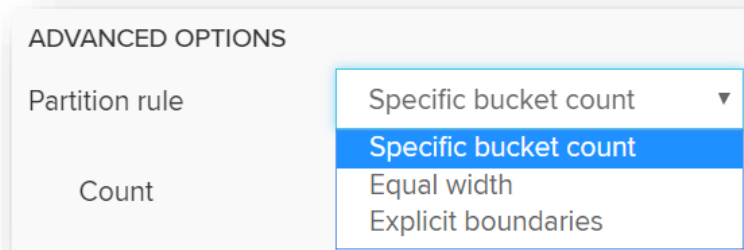
Position Line Options

Dimension Axis

Primary Value Axis

Data Series

Please notice the additional **Advanced Settings** in the General Component Settings:



To group your Dimension, you can make use of three **Partition rules**:

▼ Specific bucket count

The chart will display the given number (in the *Count* field) of groups in the Histogram, and divide/round your dimension area accordingly.

▼ Equal with

Each group area will have the given width (in the *Count* field). Please make sure to enter a value according to your selected dimension format.

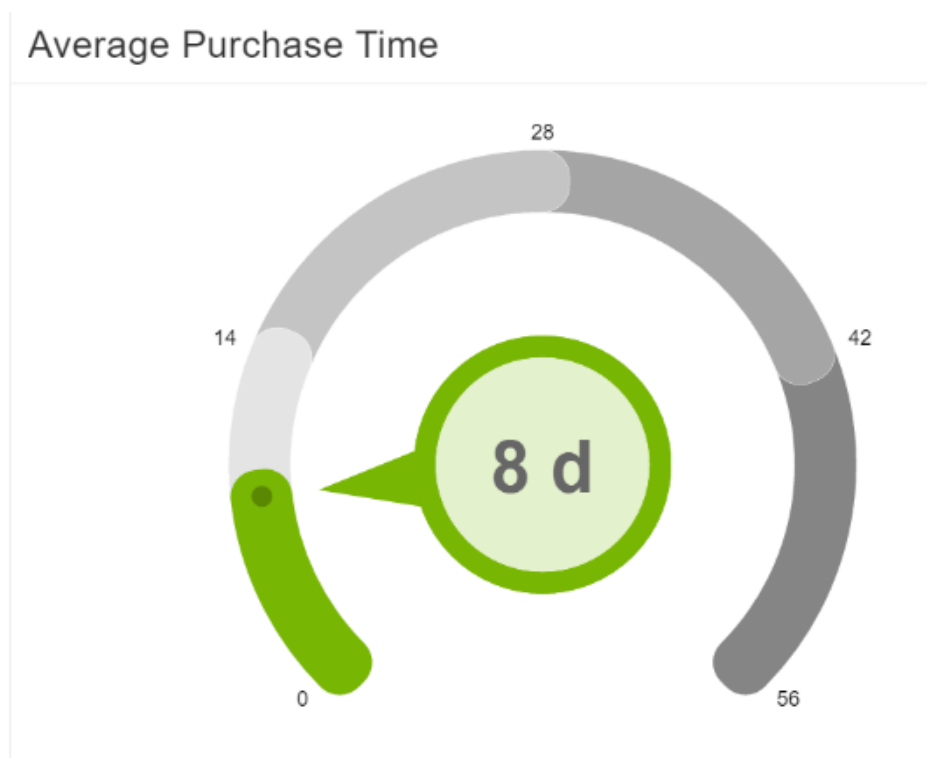
▼ Explicit boundaries

Explicit boundaries give you the opportunity to define each area manually. They don't necessarily need to have the same size.

4.3.3.11 *Single KPI*

Charts and tables are made for visualizing aggregations over various dimensions. Therefore, all previous components included settings for both dimensions and KPIs.

The Single KPI aims to illustrate **a single aggregation** without any dimensions. This is a useful tool to get a very specific aggregation on the first view.



Configuration

As the configuration of the Single KPI differs from the configuration of the other chart & table components, you will find a detailed configuration description on the subpages.

The [General Options](#) and the [Diagram Area](#) are available.

SK: General Options

The following options are available in the General Options section:

General options

Title Average Purchase Time

Type Gauge

KPI

`MEDIAN(CALC_THROUGHPUT(FIRST_OCCURRENCE['create...`

$f(x)$

Units d

Subtitle

Predefined formats Custom Formula

Formatting formula

[Documentation](#)

COLORING THRESHOLDS

☒ Thresholds ☐ Single color

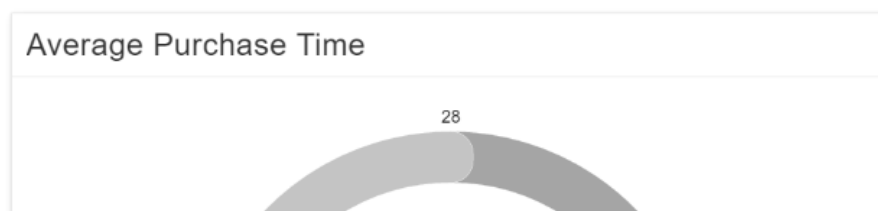
0 14 28 42 56

[Add threshold](#)

☐ Component is not filtered with selections


▼ Title

The title will appear above the Single KPI area in your analysis sheet.

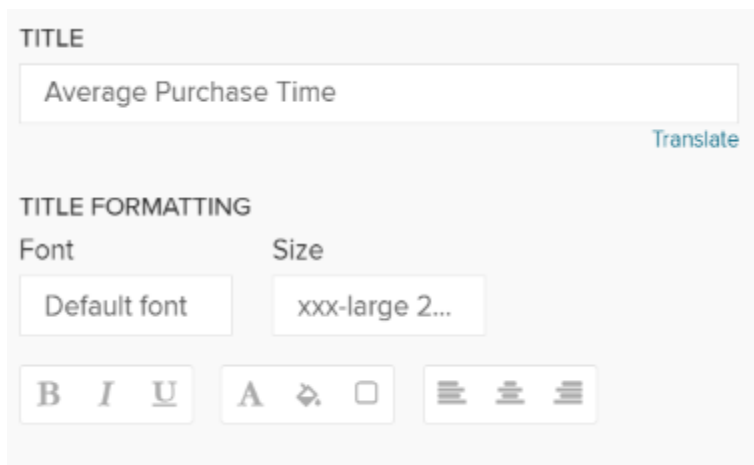


Please specify your desired title into the text field.



Next to the text field, a small pencil icon () appears.

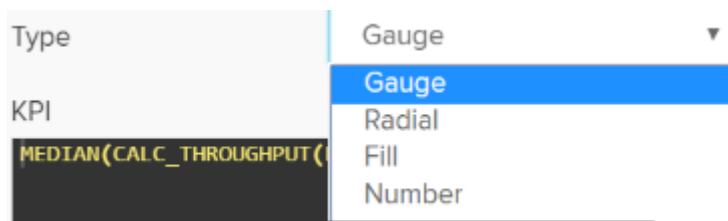
This will open the [area options](#) or display the title configuration directly under the text field:



You may edit your font, its size, text highlighting, colors (font-, background - and border color) and your text orientation.

▼ Type

The Single KPI comes with 4 different types, that can be compared to skins.

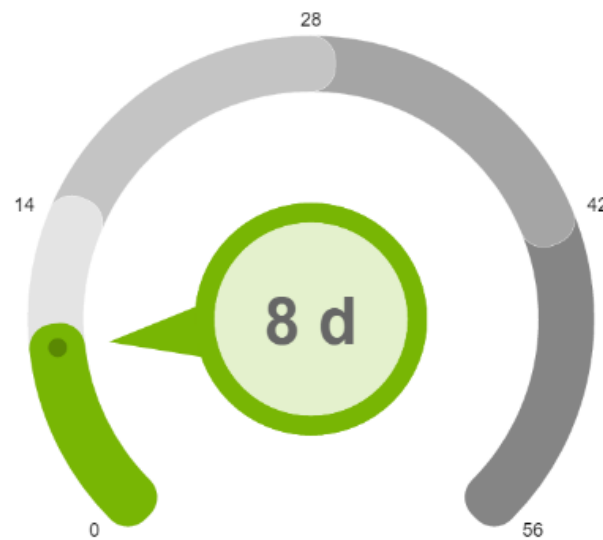


Choose any type from the dropdown list.

Let's examine the types a little further:

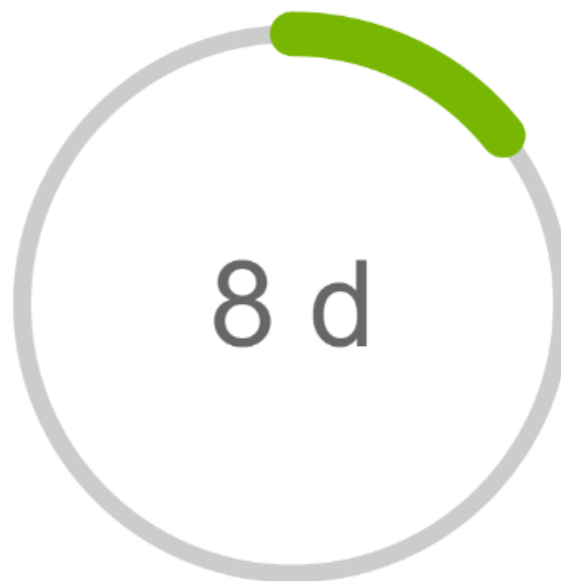
▼ Gauge:

Gauge is the default type of a Single KPI. Your component will be displayed like a tachometer:



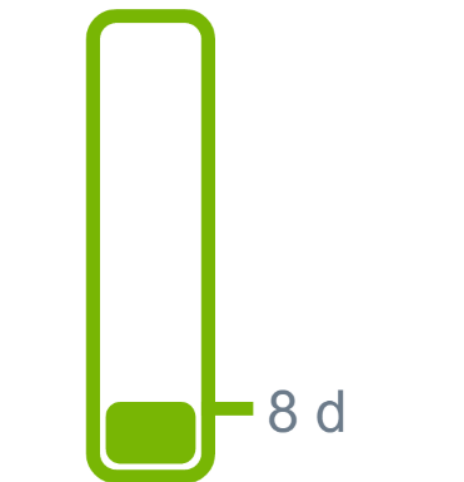
▼ Radial

Your KPI will be aggregated to a circle line:



▼ Fill

Your component will be displayed as a vertical bar.



▼ Number

Your component will be displayed as a single number.

8 d

▼ KPI

Enter your [PQL statement](#) in the KPI section.

You can make use of the [Formula Editor](#).

For the sample charts that are shown in the screenshot, the following PQL statement has been created with the formula editor to display the median time (in days) that a case in a Purchase-to-pay process needs from the Creation of a purchase order until the reception of goods.

Average Purchase Time

```
MEDIAN(CALC_THROUGHPUT(FIRST_OCCURRENCE['Create Purchase Order'] TO FIRST_OCCURRENCE['Receive Goods'], REMAP_TIMESTAMPS("_CEL_P2P_ACTIVITIES"."_EVENTTIME", DAYS)))
```

Units

In the Units field you can specify a custom unit, which will be displayed right after the aggregated number of the KPI.

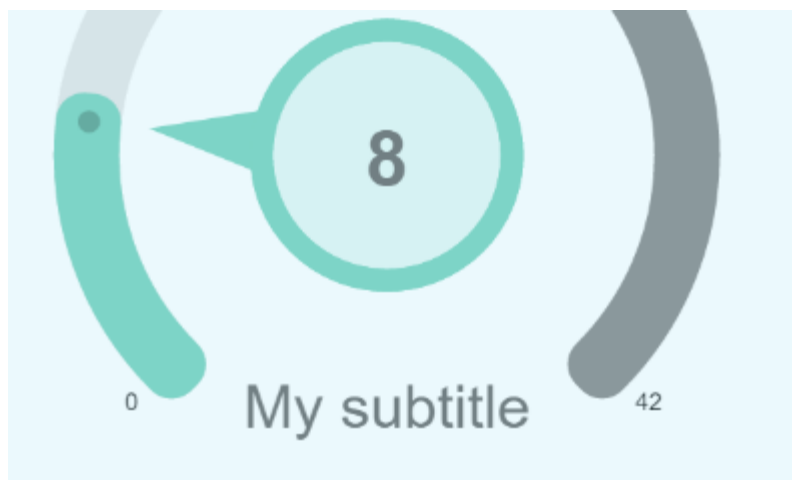
Units


8 d

Subtitle

To show a Subtitle under your component, you can use this text field:

SUBTITLE



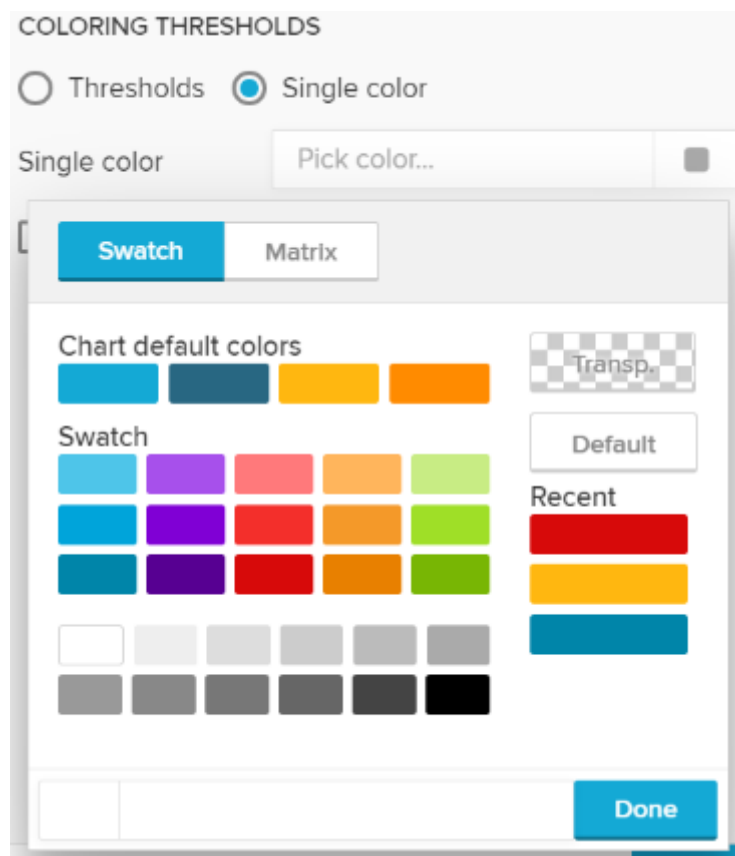
Next to the text field, a small pencil icon () appears. This will carry you on to the [Formatting Options](#)

▼ Coloring

As you can see, Single KPIs work with colors. You can choose between a Single color or use color thresholds, to color your KPI according to a certain value area.

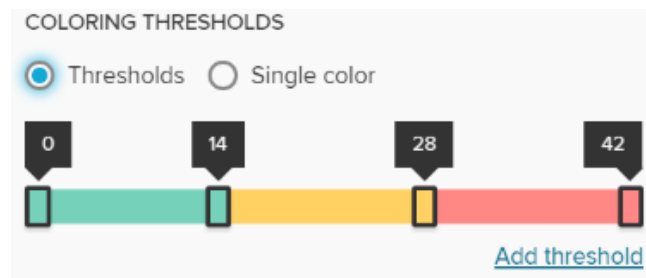
Single Color

Select *Single Color* and choose a color from the color palette. Your whole component will be colored in this color.



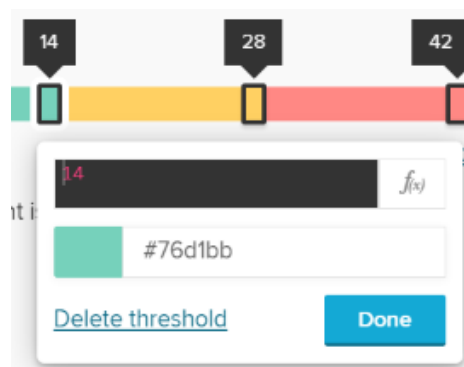
Color Threshold

Select *Threshold* to make use of value area coloring.



The displayed numbers are our thresholds.

To edit them, click on any marked area in the color stripe:



Here, you can assign a threshold as a [PQL statement](#) or enter a static number.

Entering a PQL statement allows you to color your thresholds in a dynamic matter. Not only your aggregated KPI, but also your thresholds will adopt as soon as changes in the data model occur. Additionally, you can use the well-known color palette to define a color. This color will be applied to all values that are smaller or equal to the threshold.

To delete your threshold, click on *Delete threshold*.

Don't forget to save your settings with



To add a new threshold, use the link next to the color stripe:

[Add threshold](#)

Thresholds are sorted automatically in an ascending order.

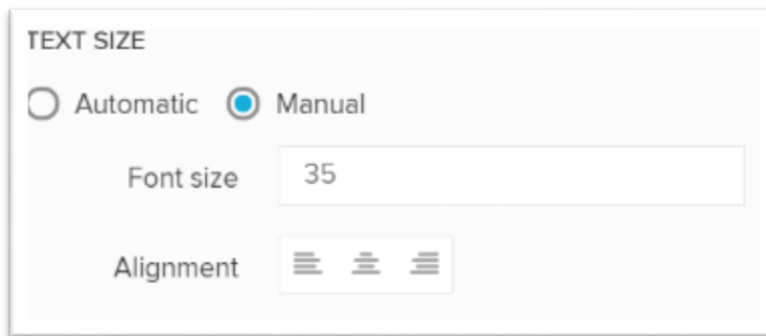
Please note, that all thresholds that exceed your aggregated KPI will be displayed in different grey colors.

▼ Text size

Please Note:

This option is only available, when you have selected the type **Number** (see above).

By default, the text size is adapted to the size of the chart area. However, you can set a manual text size by selecting *Manual*.



TEXT SIZE

☐ Automatic ☒ Manual

Font size

Alignment

Enter your desired *Font size* and your text-alignment.

If you activated a subtitle, these settings also apply for the subtitle.

▼ Component is not filtered with selections

If you don't want your component to be affected by *any* external [selection](#), activate the *Component is not filtered with selections* checkbox.

☐ Component is not filtered with selections

SK: Diagram Area

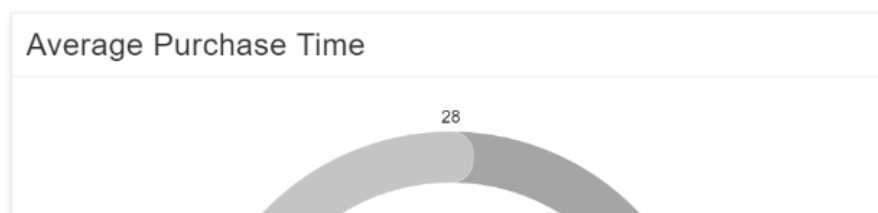
The following options are available for the Diagram Area:

The screenshot shows the 'Component options' dialog for the 'Diagram area' component. The dialog has a title bar 'Component options' with a close button. Below the title bar is a dropdown menu showing 'Diagram area'. The main content area is divided into several sections:

- TITLE**: A text input field containing 'My Title' and a 'Translate' button.
- TITLE FORMATTING**:
 - Font**: A dropdown menu showing 'Default font'.
 - Size**: A dropdown menu showing 'x-large 17px'.
 - Formatting icons: Bold (B), Italic (I), Underline (U), Text color (A), Background color, and Alignment (left, center, right).
- SUBTITLE**: A text input field containing 'My subtitle'.
- SUBTITLE POSITION**: Radio buttons for 'Left' (selected) and 'Bottom'.
- BORDER OPTIONS**:
 - Show Border**: A checked checkbox.
 - Thickness**: A text input field.
 - Style**: A dropdown menu.
 - Color**: A color selection box.
- Opacity**: A slider control set to 100%.


▼ Title

The title will appear above the Single KPI area in your analysis sheet.

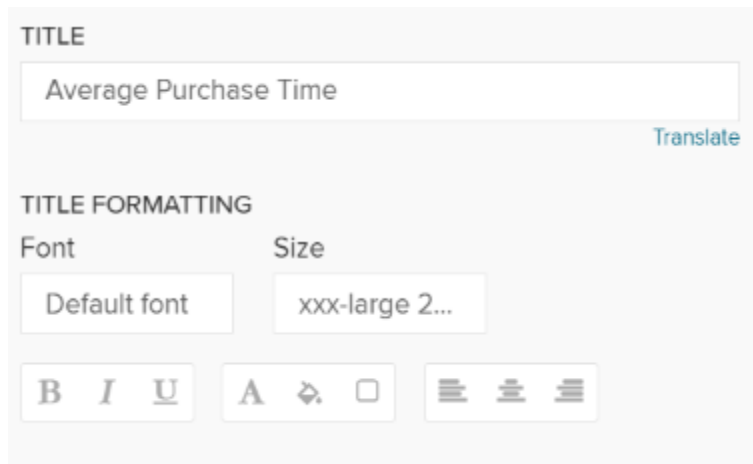


Please specify your desired title into the text field.

The screenshot shows a title input field in the analysis sheet. It consists of a label 'Title' on the left, a small edit icon (pencil) in the middle, and a text input field on the right containing the text 'Average Purchase Time'.

Next to the text field, a small pencil icon () appears.

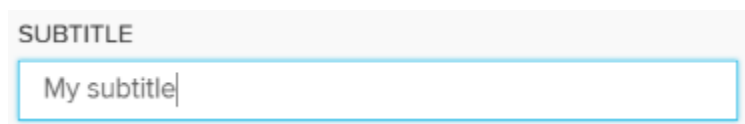
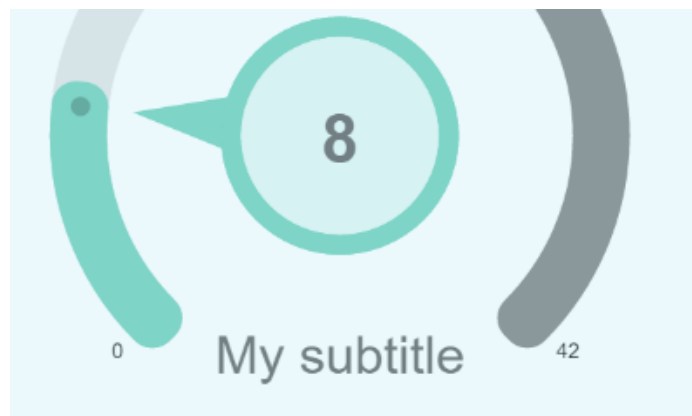
This will open the following formatting options:



You may edit your font, its size, text highlighting, colors (font-, background - and border color) and your text orientation.

▼ Subtitle

To show a Subtitle under your component, you can use this text field:

The subtitle position can only be altered when you choose the type "Number".

You can place your subtitle either below or left to your (number) KPI aggregation:

SUBTITLE POSITION

☐ Left ☒ Bottom

My subtitle 8
(left)

8
My subtitle
(bottom)

▼ Border Options

Activate the *Show Border* checkbox to surround your Single KPI with a border.
You can specify the thickness, style, color and opacity of the borderline.

BORDER OPTIONS

☒ Show Border

Thickness Style Color

Opacity 60%

4.3.4 SELECTION COMPONENTS

Selection Components are built to facilitate the creation of [Selections](#).

The following components are available:

▼ Dropdown

Dropdown

📅 Date Picker

Date Picker

✂ Cropping

Cropping

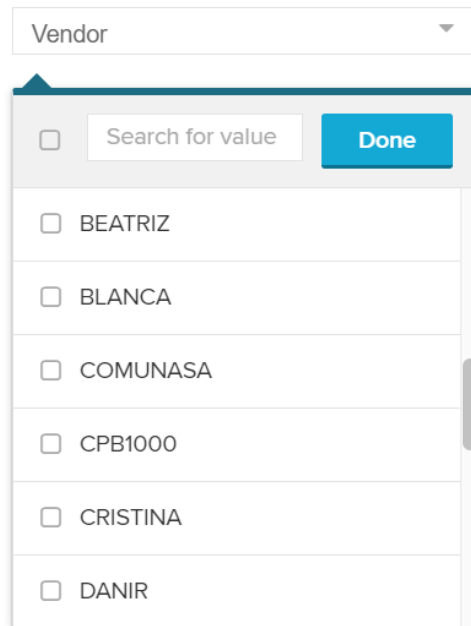
🔍 Search

Search

4.3.4.1 Dropdown


A dropdown component creates a dropdown menu on your analysis sheet to select values directly from a data source. This data source is taken directly from your data model. By selecting a value from the dropdown, the user will automatically create a Selection. This can (for example) be used to filter for various suppliers or customers.

The upcoming example will focus on vendors.



The image shows a user interface element for selecting a vendor. At the top is a dropdown menu with the text 'Vendor' and a downward arrow. Below this, a panel is open, displaying a search bar with the placeholder text 'Search for value' and a blue 'Done' button. Below the search bar is a list of vendor names, each preceded by an unchecked checkbox: BEATRIZ, BLANCA, COMUNASA, CPB1000, CRISTINA, and DANIR. A vertical scrollbar is visible on the right side of the list.

Users can select any items from the dropdown list. According to the Multiselect option in the configuration, they might even select multiple items.

After they confirmed their selection with , a selection is applied.

Configuration

The following configuration options are available:

Dropdown
×

Placeholder text

Vendor

Translate

Dropdown items

"LFAL"."LIFNR"

$f(x)$

☒ Multiselect

▼ Placeholder text

The Placeholder text is displayed in the dropdown field:

Supplier

Placeholder text

Supplier

Translate

Dropdown items

"LFAL"."LIFNR"

It will also show up, after you or a user of your analysis has made his selection in the dropdown menu:

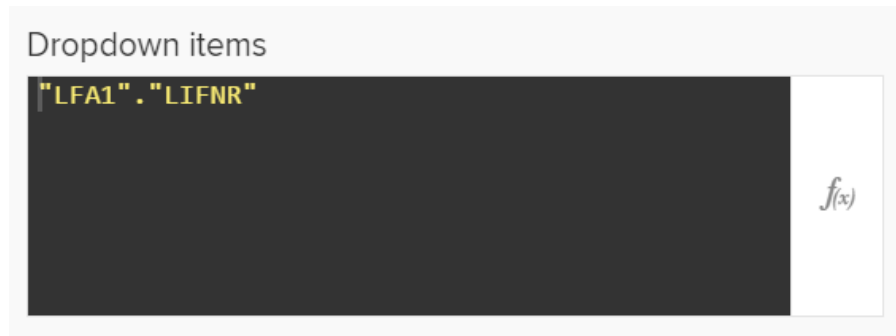
Supplier: DAVID

▼

▼ Dropdown items

This is where we can set the content of our dropdown list.

You can enter any [PQL statement](#) or use the well-known [Formula Editor](#).



▼ Multiselect

If you activate the *Multiselect* checkbox, users can select multiple items from the dropdown list.

☒ Multiselect

4.3.4.2 Date Picker

The date picker component is a selection component which allows you to create a selection on a date range of a data column. By default, the Eventlog's Eventtime is selected and the input to the date picker will filter down the data based on the Eventtime.

Clicking in one of the inputs (1) will open up a calendar in which you can choose the desired start and end date for the selection. Additionally, the buttons at the bottom allow you to quick-select the first, last and today's date (2).

Clicking on the year - month button (3) at the top will open a modal where you can directly choose a year and the month within this year.

4.3.4.3 Cropping

The Cropping component implements a [Crop Selection](#) to your analysis document.

You can select two activities (a starting activity and an ending activity). A [Selection](#) will be created for all cases that pass these two selected activities.

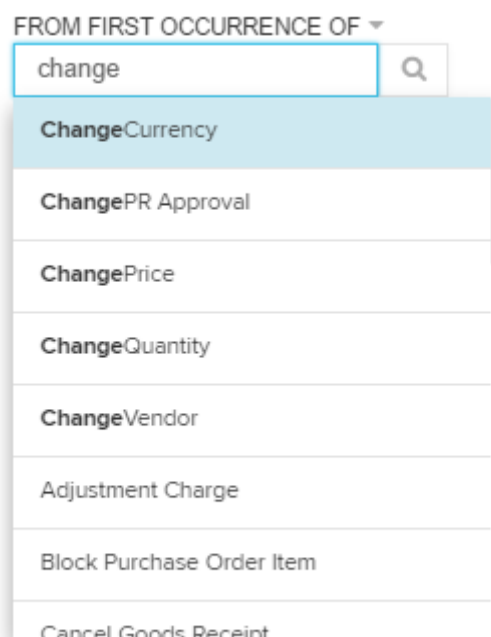


The screenshot shows the 'Cropping' component interface. It consists of two text input fields with search icons. The first field is labeled 'FROM FIRST OCCURRENCE OF' and contains the text 'Prozess start'. The second field is labeled 'TO LAST OCCURRENCE OF' and contains the text 'process end'. Below these fields is an orange 'Apply' button.

Click on one of both text fields and choose any activity from the list.

Search:

Just start typing your desired activity into the field. Your list will adopt accordingly.



The screenshot shows the search dropdown menu for the 'FROM FIRST OCCURRENCE OF' field. The input field contains the text 'change'. The dropdown list displays several activities: 'ChangeCurrency', 'ChangePR Approval', 'ChangePrice', 'ChangeQuantity', 'ChangeVendor', 'Adjustment Charge', 'Block Purchase Order Item', and 'Cancel Goods Receipt'. The 'ChangeCurrency' item is highlighted in blue.

The following screenshot shows a sample configuration, filtering for cases passing from "Change Price" to "Delete Purchase Order Item":

FROM FIRST OCCURRENCE OF ▾

Change Price ✕

TO LAST OCCURRENCE OF ▾

Delete Purchase Order Item ✕

Apply

Don't forget to save your settings with

Apply

Configuration

The following configuration options are available:

Title

BORDER OPTIONS

☐ Show Border

ALIGNMENT

☒ Auto alignment

☐ Horizontal ☒ Vertical

▾ Title

The title will appear above the Cropping component in your analysis sheet.

My Cropping Component

FROM FIRST OCCURRENCE OF ▾

Change Price ✕

TO LAST OCCURRENCE OF ▾

Delete Purchase Order Item ✕

Apply

Please specify your desired title into the text field.

After typing in the first characters in the Title text field, the formatting options will appear right below the text field. You may edit your font, its size, text highlighting, colors (font-, background - and border color) and your text orientation.

▼ Title

The title will appear above the Cropping component in your analysis sheet.

Please specify your desired title into the text field.

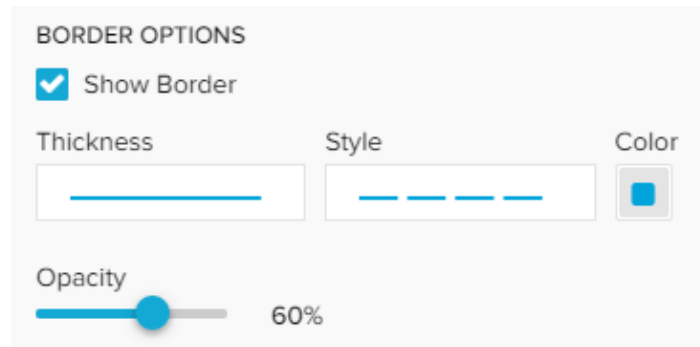
After typing in the first characters in the Title text field, the formatting options will appear right below the text field.

You may edit your font, its size, text highlighting, colors (font-, background - and border color) and your text orientation.

▼ Show Border

Activate the *Show Border* checkbox to surround your component with a border.

You can specify the thickness, style, color and opacity of the borderline.

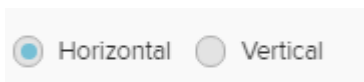


The screenshot shows a configuration panel titled "BORDER OPTIONS". It contains a checked checkbox labeled "Show Border". Below this are four controls: a "Thickness" slider, a "Style" dropdown menu showing a dashed line, a "Color" color picker showing a blue square, and an "Opacity" slider set to 60%.

▼ Alignment

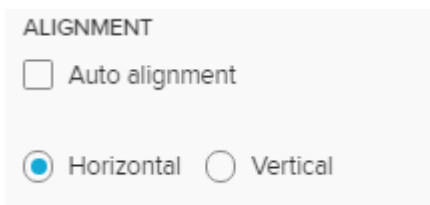
Adopt the alignment of your component.

Choose between Horizontal and Vertical (which is selected by default)



The screenshot shows a configuration panel with two radio buttons. The "Horizontal" radio button is selected, and the "Vertical" radio button is unselected.

With *Auto alignment* SAP Process Mining by Celonis 4.2 automatically picks the option to fit the available chart area.



The screenshot shows a configuration panel titled "ALIGNMENT". It contains an unchecked checkbox labeled "Auto alignment". Below this are two radio buttons: "Horizontal" (selected) and "Vertical" (unselected).

4.3.4.4 Search

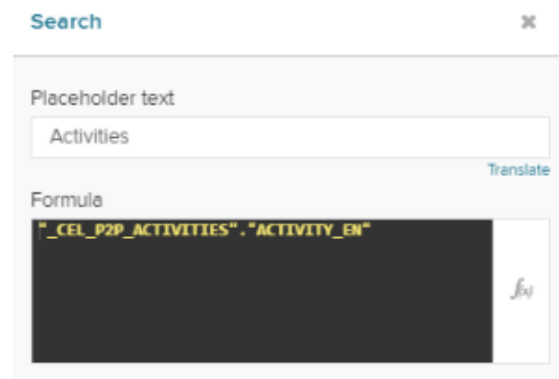
The search component allows to search for values manually.



Users can enter **any** search query here. In the context of searching Activities, they might for example enter "Concurrency". SAP Process Mining by Celonis 4.2 will now create a [Selection](#), filtering all activities, whose name includes "Concurrency".

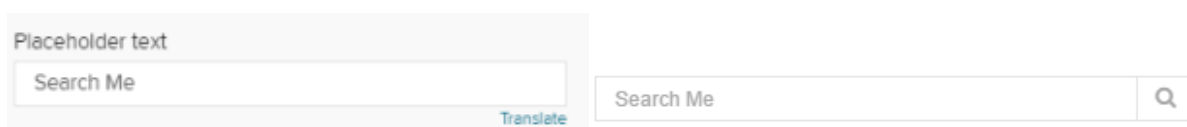
Configuration

The following configuration is available:



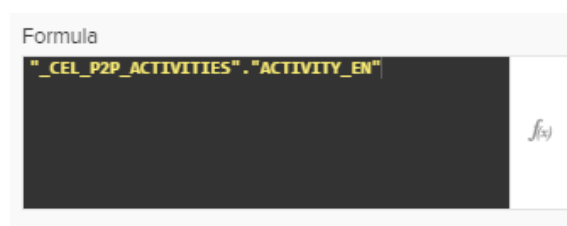
▼ Placeholder text

The Placeholder text is displayed in the text field:



▼ Formula







Determine a data source for your search. You can use any [PQL statement](#) or use the [Formula Editor](#). A very basic application is to choose a column including interesting values.



4.3.5 DESIGN COMPONENTS

The primary purpose of design components is to enrich your analysis sheets with various design features.

The following components are available:

 Variable Input	Variable Input
 Button	Button
<hr/>	
 Button Dropdown	Button Dropdown
 Text Component	Text Component
<hr/>	
 Image	Image
 Line	Line

4.3.5.1 Variable Input

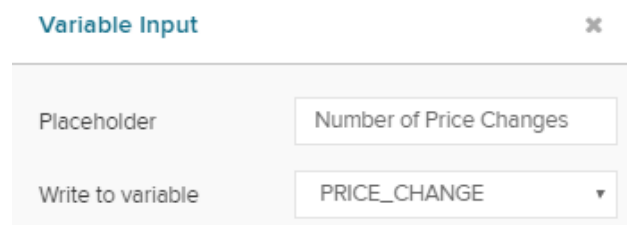
The Variable Input component lets you override an existing [Variable](#), that has been defined for this analysis document. On your analysis sheet, it appears as a single input field.


 A rectangular input field with a light gray border. Inside, the text "Number of Price Changes" is displayed in a dark gray font. To the right of the text is a small square button with a dark gray 'x' icon, used for closing the field.

The selected variable will be overwritten with the value that is inserted into the variable field. However, these changes won't be saved globally to this variable (to do so, please refer to the [Analysis Settings](#)), the scope of the change is only valid for the user's instance of the viewer.

Configuration

The following configuration options are available:


 A configuration panel titled "Variable Input" with a close button (x) in the top right corner. It contains two rows of settings:

- Placeholder:** A text input field containing "Number of Price Changes".
- Write to variable:** A dropdown menu with "PRICE_CHANGE" selected and a downward arrow icon.

▼ Placeholder

The placeholder text will be shown in your text field on your analysis sheet. Please provide a name that can be easily understood by the users of the analysis document, as they can't inspect the affected variables.

▼ Write to variable

Choose the variable, that you would like to work with. A list of all available [Variables](#) will show as a drop down menu.


 A configuration panel showing the "Write to variable" dropdown menu open. The menu lists several variables:

- PRICE_CHANGE (selected and highlighted in blue)
- ButtonDrilldown
- PRICE_CHANGE_RATIO
- My_Var
- NEW_VARIABLE

Done

Don't forget to save your settings with .

4.3.5.2 Button

This will create a button on your analysis sheet. You can assign a lot of different functionalities to the button and use it as an action button to perform a certain action or to display a message (to offer hints or further information to the users of the analysis).



Configuration

The following configuration options are available:

Button [X]

Button title

Button action ?

BACKGROUND OPTIONS

☒ Show background

▼ Button Title

Enter your desired button title. It will appear on the button.



After entering a title, the formatting options will appear.

Button title

TITLE FORMATTING

Font Size

B *I* U **A** [Align Left] [Align Center] [Align Right]

Use these options to adopt the font, its size, the text highlighting, its color and the alignment of the title.

▼ Button action

We do furthermore need to justify the action, that is performed when clicking the button. Choose your action in the dropdown menu **Button action**.

Button action ?

BACKGROUND OPTIONS

☐ Show background

According to your choice, further options will appear.

The following options are available:

▼ Open Tab

The *Open Tab* option opens another [Analysis Sheet](#). You can specify the target sheet in another dropdown menu:

Button action ?

Sheet

BACKGROUND OPTIONS

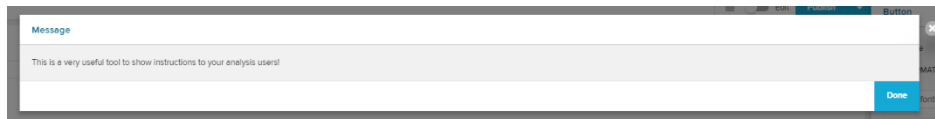
☐ Show background

▼ Show Message

Show Message will open a pop-up window with a pre-defined message. You can set a custom message in the text field:

Button action ?

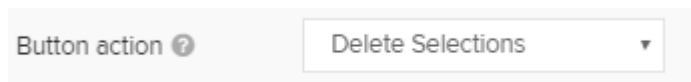
This is a very useful tool to show instructions to your analysis users!



▼ Delete Selections

Delete Selections will remove all [Selections](#) from the current analysis document.

If you defined selections in advance, they will be removed for this user's session, too. However, they won't be deleted for the document and will re-appear when reopening the analysis document.

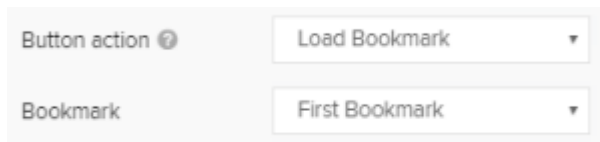


No further configuration is available.

▼ Load Bookmark

You can load a certain [bookmark](#) using a button.

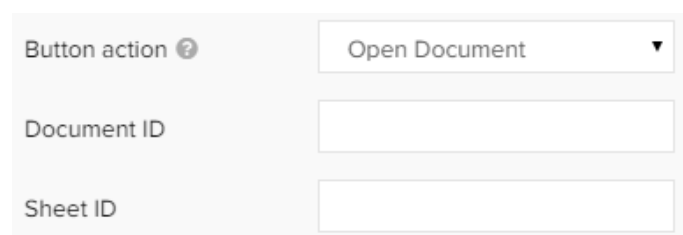
Select *Load Bookmark* and specify the bookmark:



The bookmark and its associated selections will be activated.

▼ Open Document

With *Open Document*, you can use the button as a link to another analysis sheet in another analysis document. Therefore, the ID of the analysis sheet and the ID of the analysis document, that is to be targeted, is required.



Both IDs can be obtained from the URL.

▼ Open Document

With *Open Document*, you can use the button as a link to another analysis sheet in another analysis document. Therefore, the ID of the analysis sheet and the ID of the analysis document, that is to be targeted, is required.

Button action ?	Open Document ▼
Document ID	<input type="text"/>
Sheet ID	<input type="text"/>

Both IDs can be obtained from the URL. The URLs are build up following this syntax:

<http://localhost:9000/#/frontend/documents/2/view/sheets/05c72bcf-a8a3-40bf-a8e5-4402f881c50a>

This is your Document ID, this is your Sheet ID.

▼ Set Variable

Use your button to set a [variable](#)!

Button action ?	Set Variable ▼
Variable name	<input type="text"/>
Variable value to set	<input type="text"/>

Use the Variable name dropdown menu to select a variable, and enter the value in the *Variable value to set* text field.

▼ Download Story

Last but not least, you can use a button do download a [Story](#). Use the *Story* dropdown menu to choose your story.

Button action ?	Download Story ▼
Story	<input type="text"/>

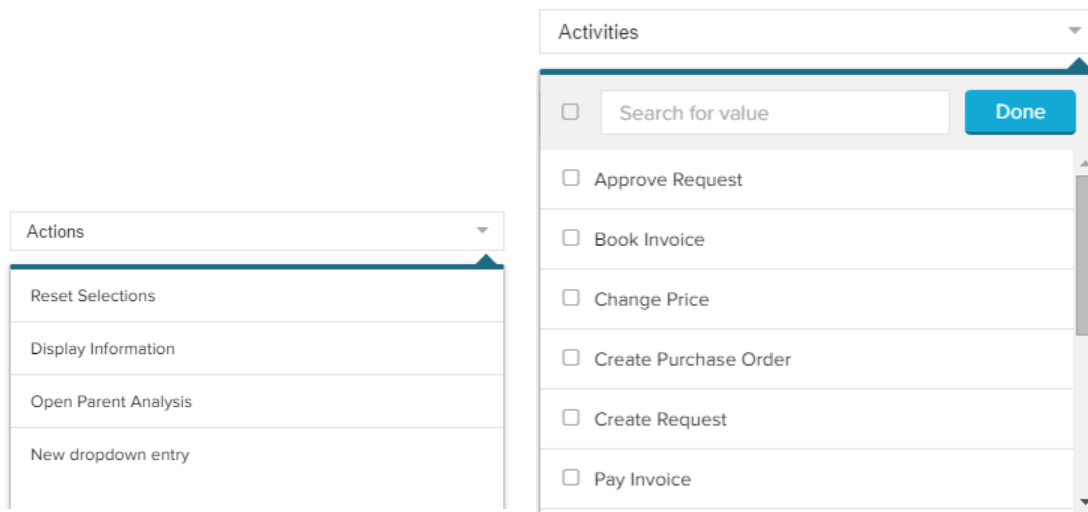
Don't forget to save your settings with

Done

4.3.5.3 Button Dropdown

The Button Dropdown is a combination of a [Button](#) and a [Dropdown](#).

It will be displayed as a dropdown menu on your analysis sheet, the entries can however be configured to work as buttons.



Buttons

Dropdown List

Configuration

The following configuration is available:

Button dropdown ✕

Title

Type your desired title in the *Title* field.

Title

The second option offers you a dropdown menu.

You can choose between *Manual Input* (which will create a dropdown menu of buttons) and *Load Entries* (which will create a dropdown selection).

Manual Input

If you choose *Manual Input* you can add dropdown entries manually, using the [Add dropdown entry](#) button.

This will create a button, that is listed in your button dropdown menu.

As these configurations equal the configuration of a button, please refer to the [Button](#) chapter to learn about the configuration.

To delete this button dropdown entry, use the small  icon on the upper left corner of the configuration.

You can add an unlimited number of buttons.

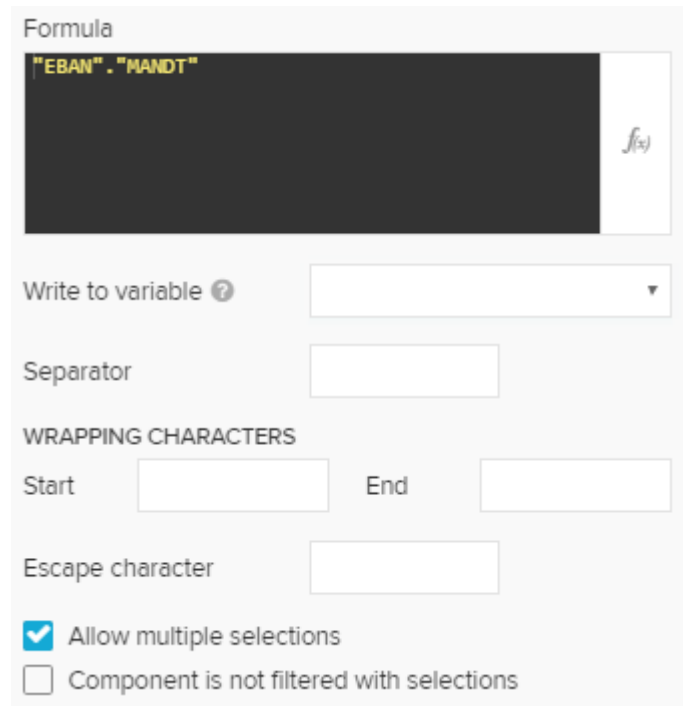
To change the listed order in the button dropdown list, you can rearrange the items by drag & drop using this icon:



▼ Load Entries

Load Entries is a great way to include a [Dropdown](#) list into your button dropdown.

The following configuration options are available:



Formula

"EBAN" . "MANDT"

Write to variable ?

Separator

WRAPPING CHARACTERS

Start End

Escape character

☒ Allow multiple selections

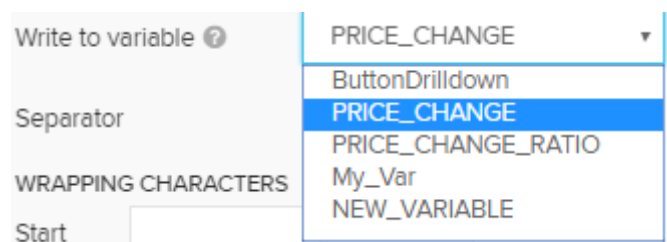
☐ Component is not filtered with selections

As most of these options are used in the dropdown component, too, you might want to check out the [Dropdown](#) chapter.

After entering your **Formula** (optionally using the [Formula Editor](#)), you could simply confirm the entries with [Done](#).

This would give you an exact Dropdown component, which is a great way to create [Selections](#).

However, a button dropdown can store the selected values in [variables](#)! Use the **Write to variable** dropdown menu and choose any variable.



Write to variable ?

Separator

WRAPPING CHARACTERS

Start

PRICE_CHANGE

ButtonDrilldown

PRICE_CHANGE

PRICE_CHANGE_RATIO

My_Var

NEW_VARIABLE

Specifying a **separator** will help you to organise your data in your variable. This might be important, if you choose to store multiple values to your variable (with this button dropdown). Values will be separated with this separator. However, we recommend to align the separator with the data type of your variable values. A, might seem great for integer values but could lead to confusion with double values.

Use **wrapping characters** to apply wrapping rules to your entry. You can "cut" the entry's value by *start* characters at the beginning and/or by *end* characters at the end. *Escape character* is great if your entries are very long.

If you activate the **Allow multiple selections** checkbox, users can choose multiple values from the button dropdown. If you activate the **Component is not filtered with selections** checkbox, previous applied [selections](#) in your analysis sheet won't affect this button dropdown (you will still see all entries that meet the requirements of your above specified formula).

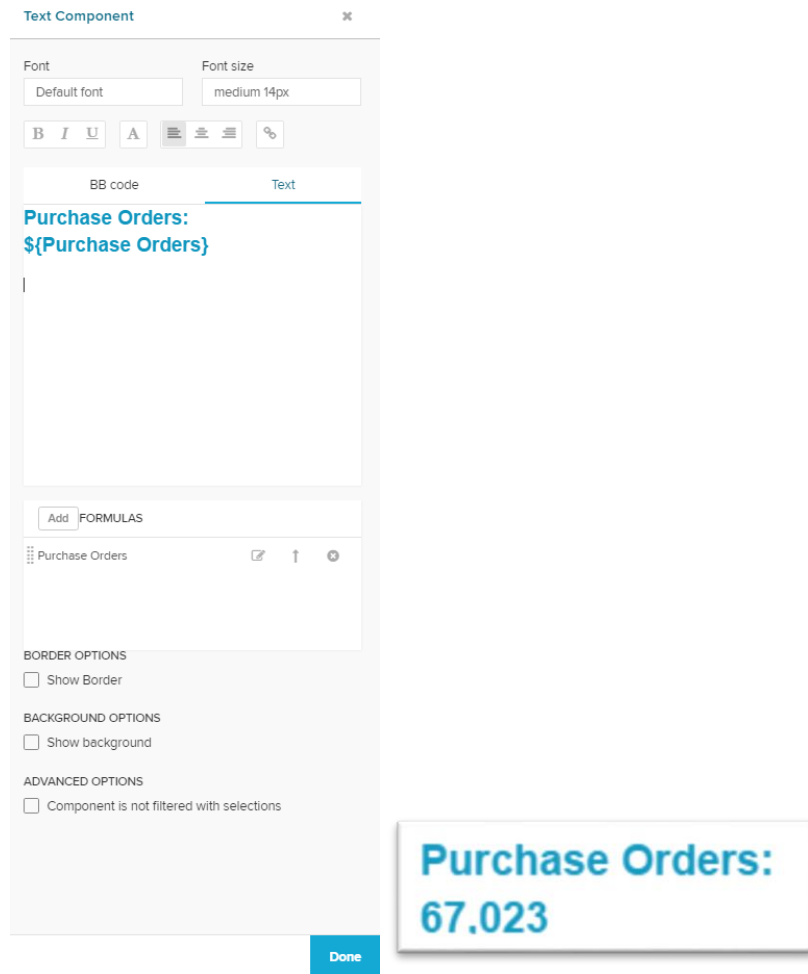
4.3.5.4 Text Component

Use a Text Component, to display a static or a dynamic text in your analysis sheet. You may for example use a text component to display instructions, explanations or further information regarding your analysis. However, you can also use it to display a dynamic number, that is derived from a KPI. A great application of the text component is to display the net value or the number of orders in a process cockpit. Please note however, that the numbers are derived from KPIs and therefore they are set up to follow [selections](#).

# Orders:	67,023
Net Value:	45.3B €

Configuration

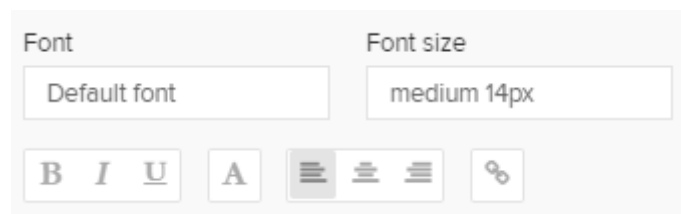
The following screenshot offers a sample configuration, displaying the Number of Purchase Orders with a short title:



The following configuration options are available:

▼ Formatting

You can format your Text component as every other component title.

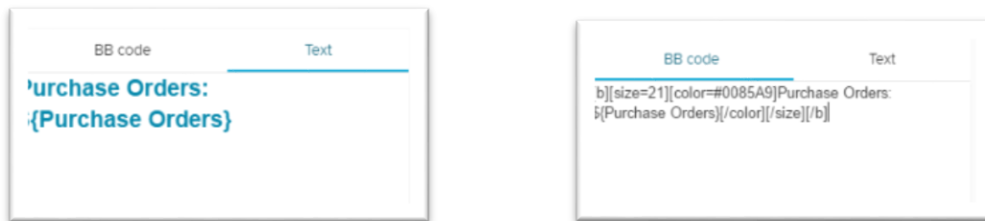


Choose a Font, specify its size, alter the text highlighting, the text color, its alignment and add a hyperlink.

▼ Text Area

Here, you can display your text.

You can choose (and switch in between) between a normal text editor, and a [BBCode](#) editor.



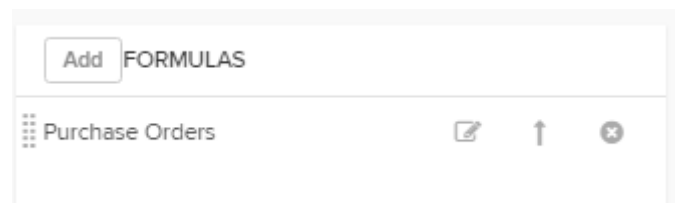
▼ Formula

To display dynamic content in your text area, you can make use of Formulas.


Click on .

This will open the well-known [Formula Editor](#). Create your desired KPI and **name your formula**. We will need this name to identify it in our text component.

After you have set up your formula, it will appear in the Formulas section:




Use the  icon to reopen the Formula Editor.

Use the  icon to include this formula in your text.

This will create the following text in your text area:

`${The Name Of Your Formula}`

You can copy it and paste it anywhere within your text component.

Use the  icon to delete your Formula.

▼ Border Options

Activate the *Show Border* checkbox to surround your text with a border.

You can specify the thickness, style, color and opacity of the borderline.

BORDER OPTIONS

☒ Show Border

Thickness

Style

Color

Opacity 60%

▼ Background Options

Set a background color for your text!

Activate the *Show background* checkbox, select a color and adjust the opacity.

BACKGROUND OPTIONS

☒ Show background

Opacity 30%

Color

▼ Component is not filtered with selections

If you don't want your text formula to be affected by *any* external [selection](#), activate the *Component is not filtered with selections* checkbox.

☐ Component is not filtered with selections

4.3.5.5 Image

Place an image on your analysis sheet!

With images, you can ease the look of your analysis. When creating a company template, this component is also useful for including your company's logo.



Configuration

The following configuration features are available:




SAP Process Mining by Celonis 4.2 differs between two kinds of images: *Document Only* and *Shared* Images. Document Only Images can only be placed among the same analysis document; shared images can be used among different analysis documents (within one project).


To upload an image, press the

Upload image...

Choose an image from the file browser, and click on *open*. All uploaded images will be placed in the *Document Only* section. Click on any image to open the configuration options, which will appear below the image.

Click on  to move this image to the *Shared Images* section.

As already mentioned, this image will now be available in all analysis documents in the whole project.


Click on  to delete this image.

This can't be undone!

With *Background color*, you can specify a custom color for your image. The image does not necessarily take all the available space that is assigned in the analysis sheet (through scaling), except for the case that the scaling meets the exact proportions of the original image. *Image position* therefore moves the image to a certain corner of the available space.

Image position

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Don't forget to save your settings with .

4.3.5.6 Line

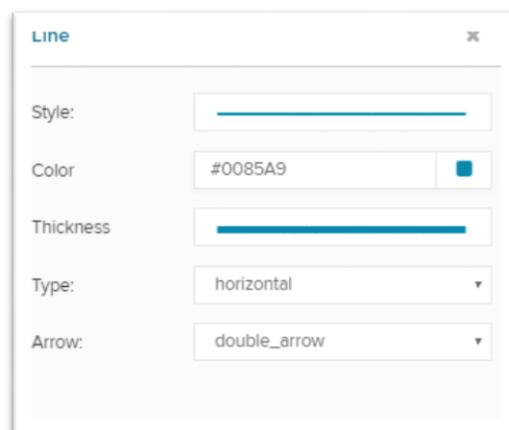
This is another tool to design your analysis sheet. You can insert lines and turn them into arrows to separate, surround or highlight certain sections.



This screenshot shows 4 separate line components. 3 of them are configured as arrows.

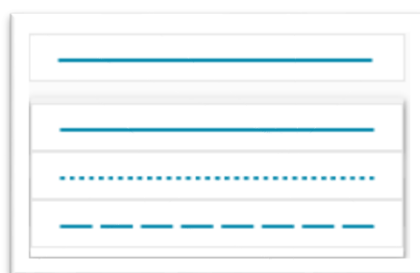
Configuration

The following configuration options are available:



Start choosing a **style**:

The dropdown menu offers the following options:



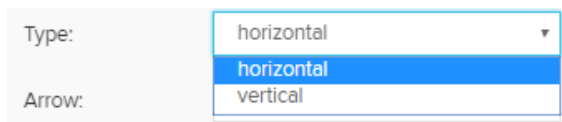
Now let's choose a **color**:



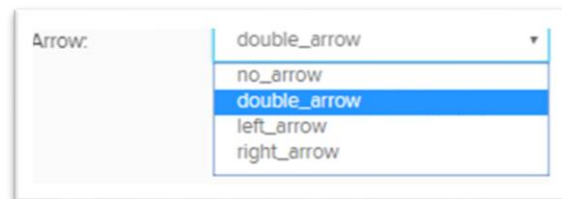
You can choose between different levels of thickness...



... and set the type of your line, which will determine, whether your line is aligned vertical or horizontal:



Finally, you can set your line to be an arrow:



4.3.5.7 Logo

The Logo component places your logo on your analysis sheet. You can set your logo in the [System Settings](#).

As soon as you drag & drop the component in your analysis sheet, the logo will appear. You can rescale it as every other component.

However, no further configuration is available. (Remember, you can still make use of the [Image](#) component).

Process Analysis Components

The following, powerful components are currently available in SAP Process Mining by Celonis 4.2.

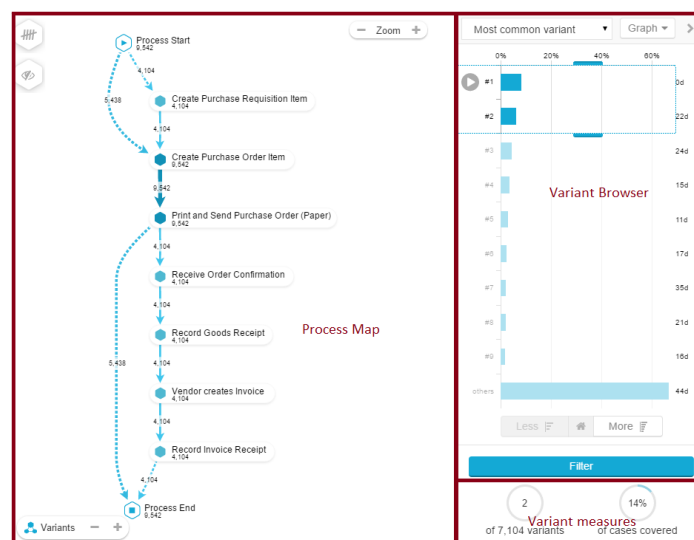
Process Explorer

Learn, how to successfully set up and manage a process explorer.



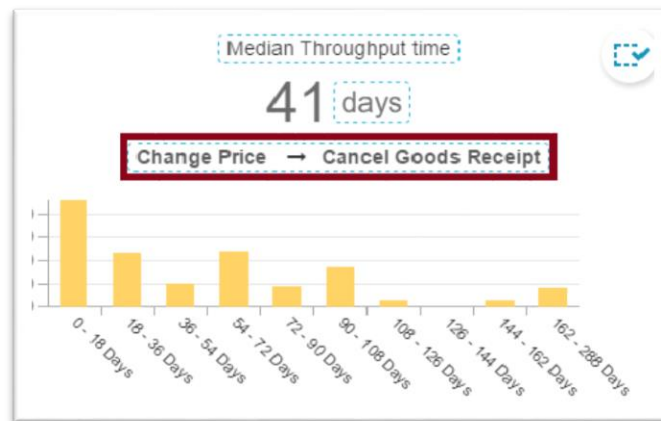
Variant Explorer

Explore your process based on end-to-end variants!



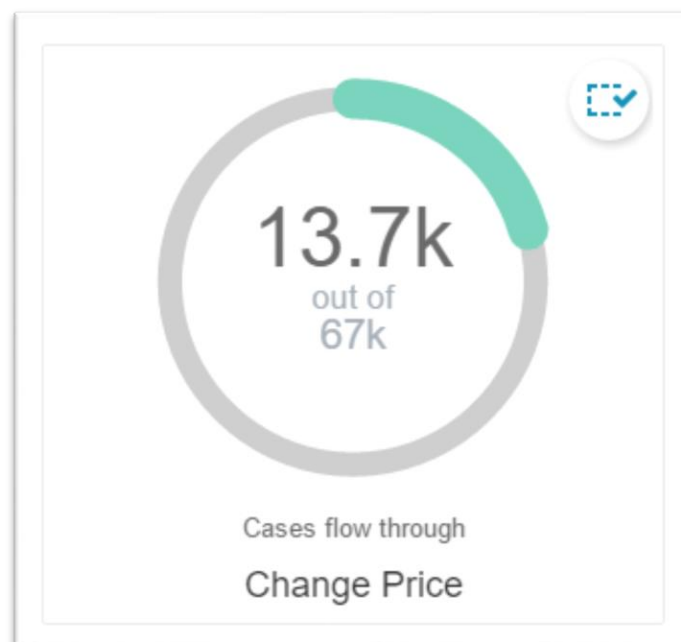
Throughput Time Search

Stay in control of your throughput times!



Activity Explorer

Find out, how a certain activity relates to your process, at first glance!



4.4 DIMENSIONS & KPIS

Components require the configuration of **Dimensions** and **KPIs**.

Dimensions

Dimensions basically represent the columns of the table you selected as data source for this document. In contrast to KPIs, there are no restrictions as to which data types can serve as dimensions therefore all columns available in the table can be selected. Your choice of a dimension will define the possible level of KPIs for your data. If, for example, you add a dimension containing dates and want to round all dates to month, there will be a maximum of twelve possible KPIs for one year. However, if you round the dimension to years, there will – for one year – only be one entry with one KPI in your analysis component.

Number of dimensions:

There is no limit of dimensions, however, you should keep in mind that too much dimensions might increase the complexity of the component for a viewer of your analysis.

KPIs

KPIs are functions that consolidate a set of values belonging to a single occurrence inside a dimension into one single value. Consolidation can be done by accumulating the values, by calculating the **average**, **minimum** or **maximum** or simply by **counting** the number of occurrences.

To give a short example let's assume your data contains a table listing all invoices you received from vendors and their respective order values. Now if you choose "vendor" as dimension and the sum of "order value" as KPI, for each vendor all entries in your data will be accumulated regarding their order values. Your result set will contain one entry for each vendor and his respective sum of order values. If you choose "avg" as aggregation function, the average of the order values will be calculated for each vendor. If you choose "min" or "max", the minimum or maximum order value will be selected and presented in the result set.

Apart from the function "count" all KPI functions need to be based on another column than the dimension column. Since these functions can only be performed on numerical data, only columns containing numerical data types will be available for selection. Basically, the table selected as data source will be scanned for numerical data types and all columns meeting the criteria will be provided as bases for KPIs.

The function "count" simply counts the number of occurrences for each value in the dimensions column (so for our vendor example, the result set would contain an entry for each vendor and the number of invoices you received from him). If you use KPIs with **two or more dimensions** KPIs will be calculated for each unique combination of all dimension values occurring in the data source.

Depending on the Chart Type, the number of possible dimensions and KPIs will vary (please see the following table). Only [Charts And Tables](#) are listed.

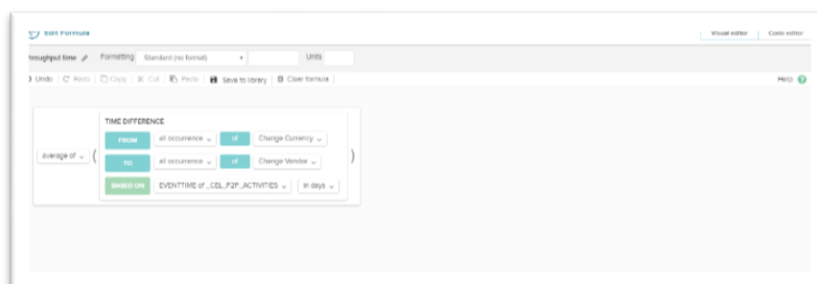
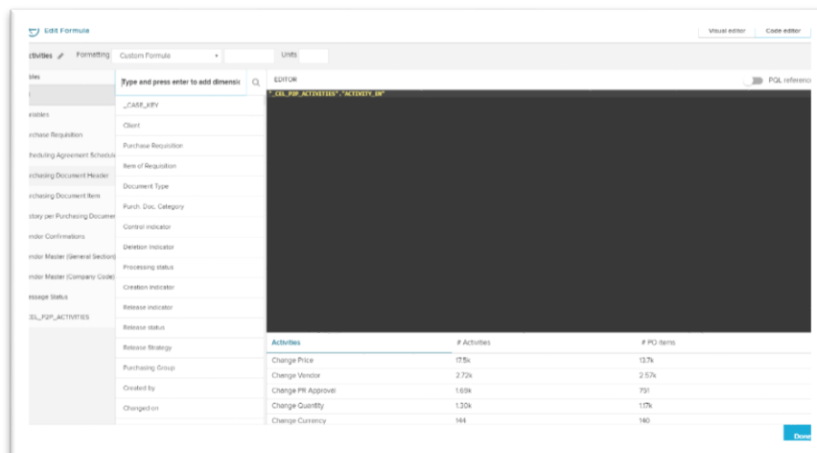
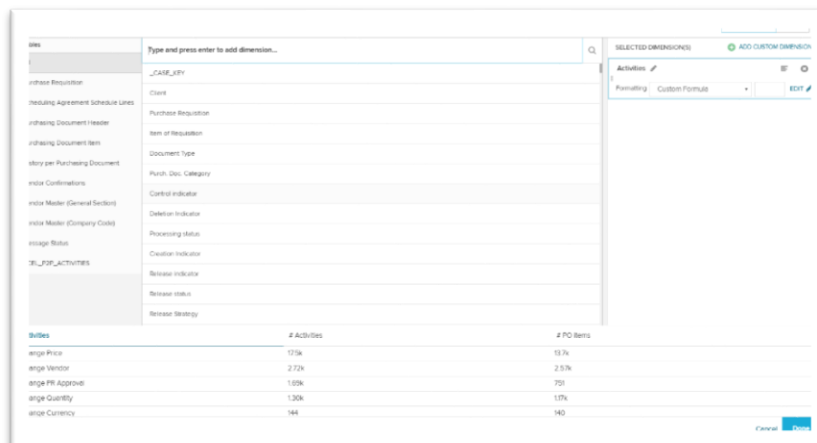
Chart Type	Dimensions	KPIs
OLAP Table	∞	∞
Column Chart	1	∞
Pie Chart	1	1
Donut Chart	1	1
Line Chart	1	∞
Area Chart	1	∞
Scatter Chart	1 or 2	1 or 0
Bubble Chart	1	2


Proceed to the [Formula Editor](#) and learn how to use dimensions and KPIs in your analysis.

4.4.1 FORMULA EDITOR

The Formula Editor creates [Dimensions & KPIs](#) to be used in any components. This is why you will find a linkage to the Formula in every component's settings, that offers dynamic content.

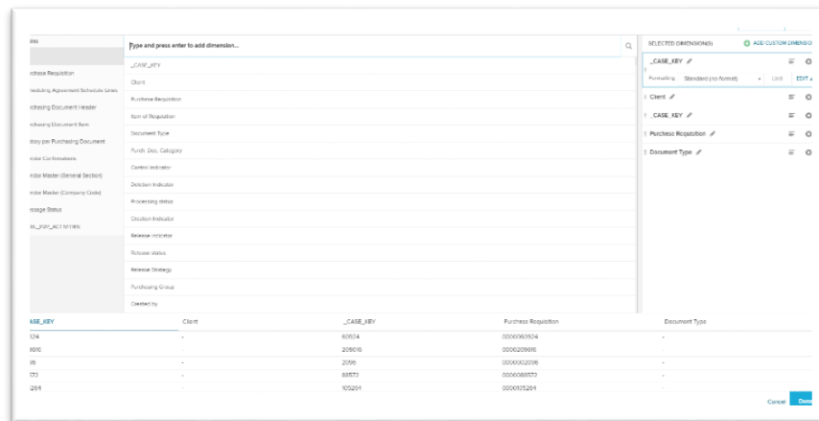
The Formula Editor can configure Dimensions and KPIs separately.



To add any Dimension or KPI, you will find a small  icon above every dimension and KPI.

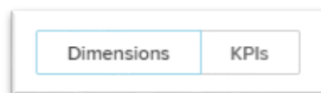
This will open the following **Overview**.

Overview



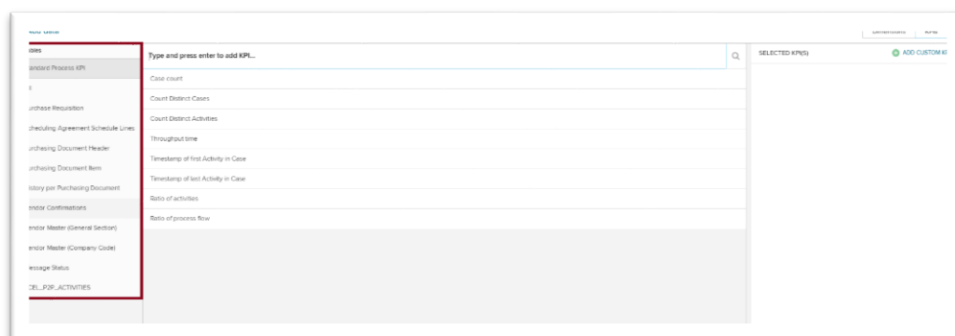
The Formula Editor can edit Dimensions and KPIs. This overview can be used to select dimensions or KPIs according to table columns and pre-defined dimensions/KPIs.

Start choosing between Dimensions and KPIs, using the buttons in the upper right corner:



Let's have a closer look at the overview section:

In this section on the left, you can choose a table from your data source.



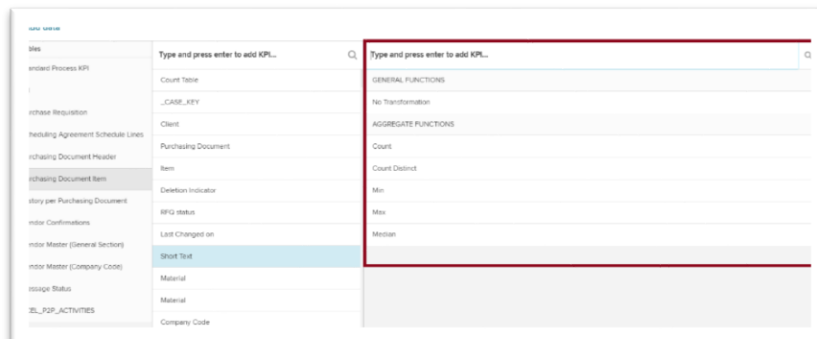
Standard Process KPIs:

For KPIs, *Standard Process KPIs* will be available too, and offers some basic Dimensions (such as "Number of Activities per Case" or "Time between <Activity A> and <Activity B>"). If you choose one of them, no further columns will be shown. Click on one entry of this table list, to see its columns in the second column:



After choosing a column, a third area *Choose Function* might appear (depending on the data type of your selected column). For example, if you would like to select *Year of Credit Applications* as a Dimension, you might choose the *EventTime* column from the *Cases* table.

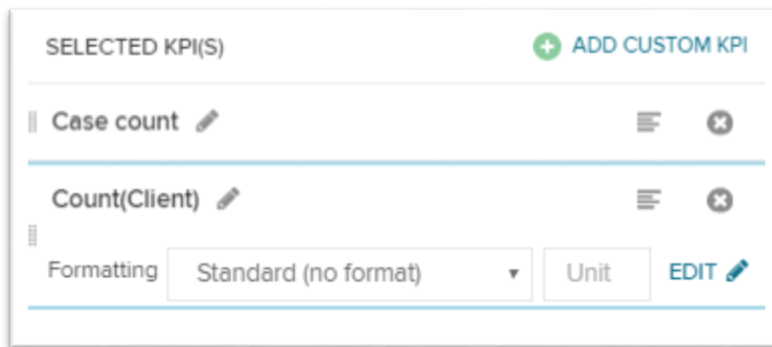
If you are choosing a KPI, a third column will appear after choosing a column. This is where we actually set our KPI. Please note however, that the shown KPI depends on the datatype of your selected column.




short text	introduction	unit of measure
RetScreen LE 50 P	M-OS	ST
Ball bearing	100-500	ST
RetScreen LE 50 P	M-OS	ST
RetScreen LE 50 P	M-OS	ST
RetScreen LE 50 P	M-OS	ST


Preview:


At the bottom of the page, a preview of your data is displayed. This data depends on the selected dimensions/KPIs. After you selected your dimensions/KPIs, they will appear on the right side of the screen:



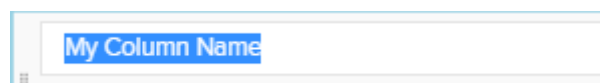
Click on any entries, and the associated column will be highlighted in the preview at the bottom of the field.

Use the small  icon to delete this dimension/KPI.

Use the small  icon to apply a sorting rule. You can choose between a descending and an ascending order (re-click this icon to change).

Use the small  icon to edit the title of your dimension/KPI. This is the name that will be displayed in the configuration options of your component. We recommend to choose a title that is easy understandable.

You are free to use any characters, whitespace or symbols (any String value will be accepted).



Below the title and the mentioned configuration options, you can alter the [Value Formatting](#) of this dimension/KPI.

4.4.1.1 Custom Editor

The Custom Editor is a useful and powerful tool to create dimensions or KPIs.

It furthermore comes with a clear user-interface:

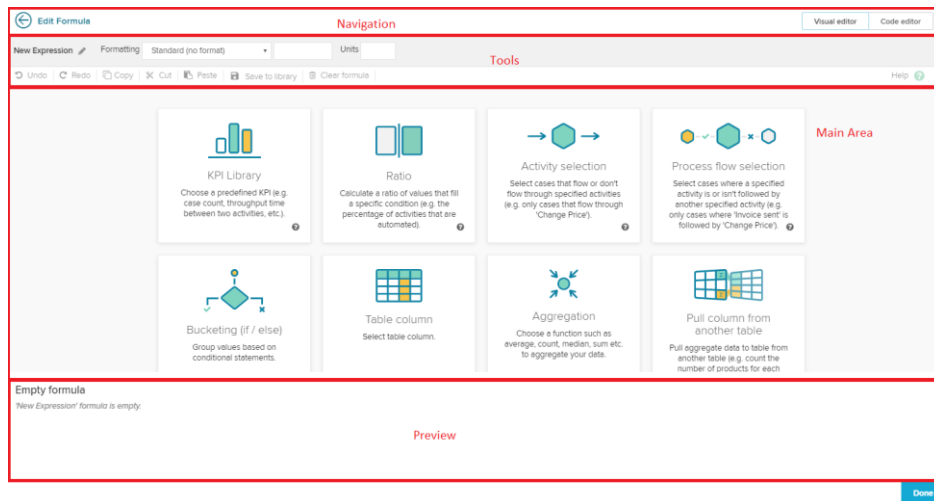
The top screenshot shows the 'Visual editor' of the Custom Editor. It features a formula builder with a 'sum of' function and a conditional statement: 'when Document number of Purchasing Document Header equals to NULL then 0 else 1 integer'. Below the formula builder is a table with the following data:

Activities	My Formula	# PO Items
Change Currency	1.00	140
Change PR Approval	7.00	751
Change Quantity	7.00	117k
Change Vendor	25.0	2.57k
Change Price	175	13.7k


The bottom screenshot shows the 'Code editor' of the Custom Editor. It features a SQL-like formula: 'CASE WHEN SMALL("error", "document") = 1 THEN 0 ELSE 1 END'. Below the code editor is the same table as in the top screenshot.

To access the Custom Editor, click on [+ ADD CUSTOM DIMENSION](#) or [+ ADD CUSTOM KPI](#) in the [Overview](#).

The following overview will appear:



Navigation

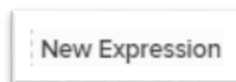
The navigation allows to close the Custom Editor () and to switch between the [Visual Editor](#) and the [Code Editor](#).

Tools

The tools are separated in two sections:

The upper line is there to choose a name for your dimension / KPI. This name will appear in the configuration of the components.

Use the small  icon to edit the title:



The title area will be surrounded with dotted lines. Confirm your change to the title by pressing *Enter* on your keyboard. Furthermore, you can access the [Value Formatting](#) section for your current dimension/KPI.

All tools in the second line are only used (and therefore explained) in the [Visual Editor](#).

Preview

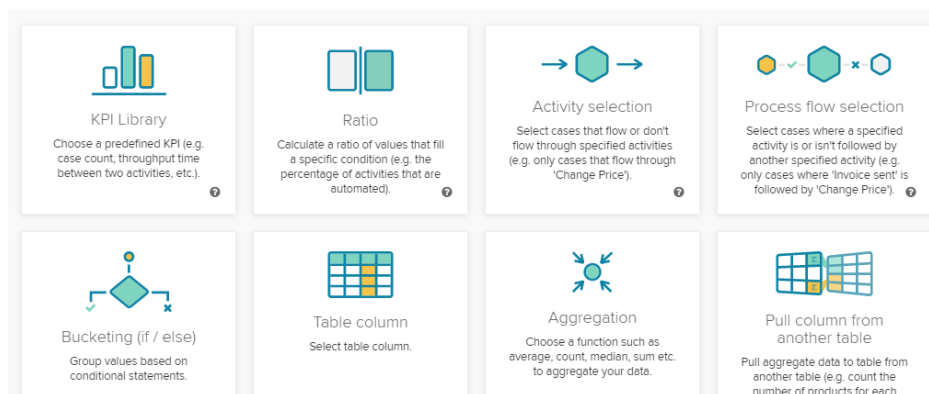
To support the creation of dimensions and KPIs, SAP Process Mining by Celonis 4.2 gives you a preview of your data in this section. If you have never worked with dimensions or KPIs before, let's start with the [Visual Editor](#).

Visual Editor

The Visual Editor offers a graphical user interface to "build" dimensions and KPIs utilizing visual block representations of PQL statements.

The first step after the creation of a custom dimension or custom KPI is to choose a **category**. This will create a template in the main area with recommended connections.

The following categories are available:



▼ KPI Library

The KPI library stores predefined standard KPIs like the case count or the throughput time. It is also possible to save your custom formulas and re-use them from the KPI library.

▼ Ratio

The ratio block calculates the ratio of values that fulfil a certain condition. The only input that is required to do that is the condition itself. A condition can be a column or aggregation that matches a certain value or any process filter. You can choose between a simple ratio, a activity ratio, a process flow ratio and a custom ratio.

▼ Activity Selection

The activity selection block allows you to set a condition on the cases based on the activities they contain. You can specify if a case is flowing or not flowing through an activity or if a case is starting or ending with the chosen activity.

▼ Process Flow

The Process flow selections allow you to set a condition on the path of the cases. You can define which sequence of activities the cases flowing through. This includes the possibility to define direct and indirect connections between the single activities.

▼ Bucketing (if/else)

The bucketing allows you to split up your data according to a defined condition. You can set a condition on direct column values or aggregations. You can add multiple conditions to your formula and create as many buckets as you want. The conditioning can be used to calculate formulas based on the condition or simply label a dimension.

▼ Table column

The table column block allows you to add a column from one of the tables in your data model to a formula.

▼ Aggregation

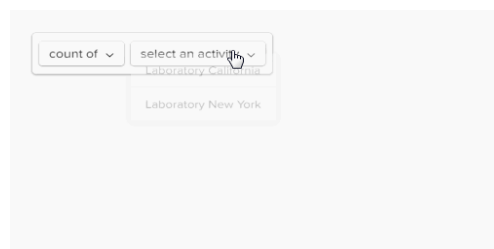
Aggregations allow you to apply operations on your data. The aggregations that are available are:

- Average
- Sum
- Count
- Count distinct
- Count table
- Maximum
- Minimum
- Medium standard deviation
- Variance

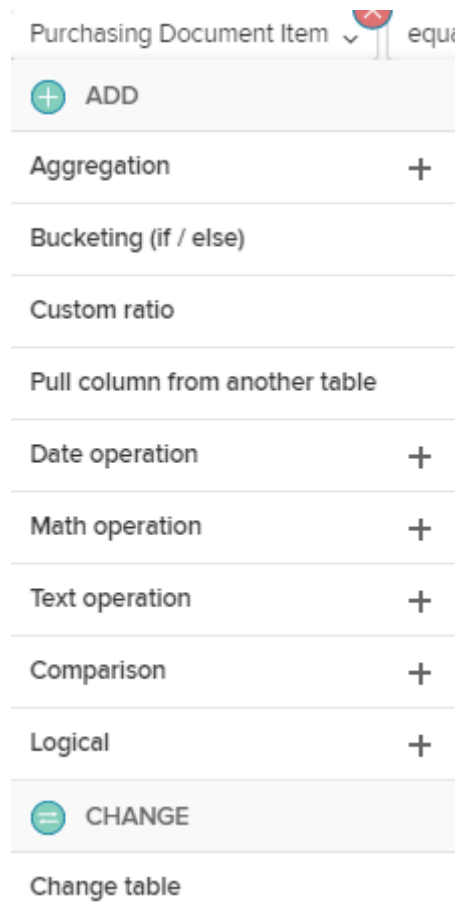
▼ Pull column from another table

The pull-up-function calculates the KPI on the table that was specified by the user. The calculations are therefore grouped on basis of the foreign key connection between the base table and the aggregated column. You can also set conditions on the calculation, so that only the data matching this condition is taken into consideration.

Let's focus on the main area and the toolbar. The main area offers a pre-defined template, according to your category selection. This template allows you to create your dimension/KPI, using drop-down menus. They offer either functionalities or columns

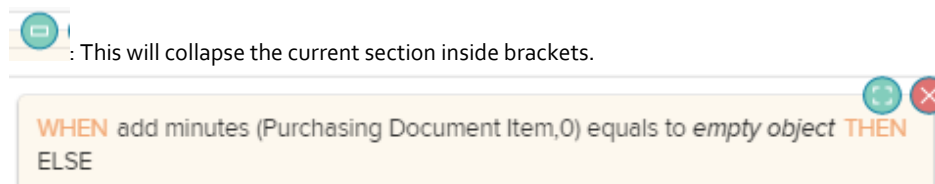



If you have already selected a column or a table, the menu will offer the following possibilities:




With **Change**, you can choose another table or column. With the functions listed at the **Add** section, you can apply operations to your column. This usually leads to the addition of brackets, to specify the new operation. Please note, that the category templates are meant to support you. However, you can of course edit or rearrange each of them to support your requirements.

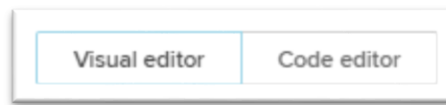
If you are editing a section inside brackets, you can click into the section to furthermore work with the following two icons, that will appear at the upper right corner of your current section:



To re-edit this section, use the  icon.

 : This will permanently remove this section. Included sections will be deleted as well, parent sections won't be affected. The hierarchy will be adopted.

You can at any time switch to/from the [Code Editor](#) using these buttons:

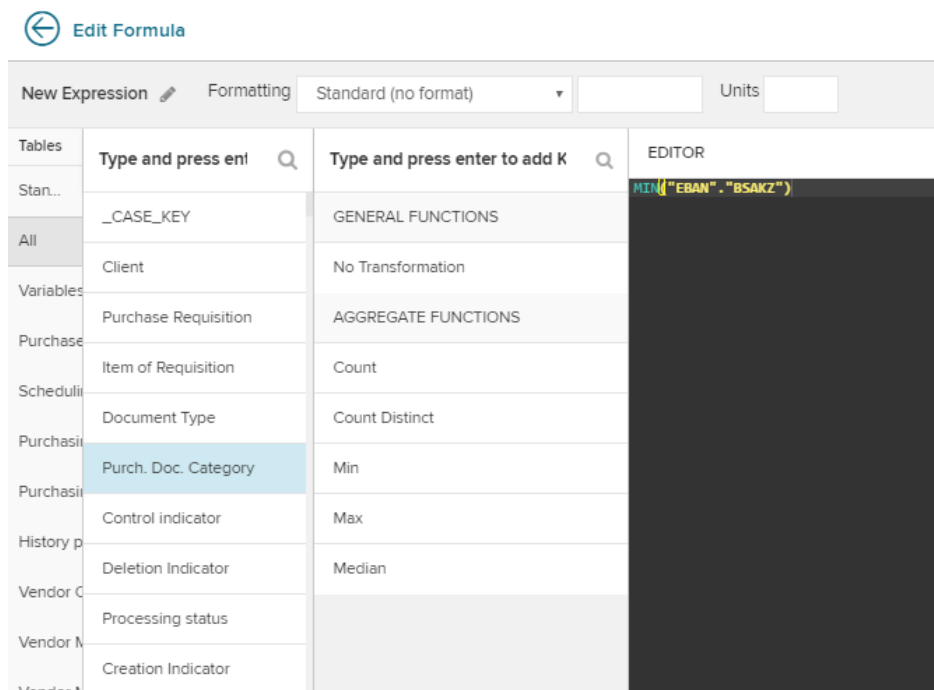


Any changes that are made in the Code editor or in the Visual editor will be adopted.

Code Editor

The Code Editor lets you design and edit your dimensions/KPIs based on a graphical column selection and a PQL editor.

To work with the Code Editor, we recommend to consult the [PQL-Tutorial](#).



Use the left side of the main area to select a table and a column. If you are creating or editing a KPI, a third column will appear - use this to choose your KPI. Again, the available options depend on the data type of the selected column.

After selecting a column and/or a KPI, your changes will appear in the Editor on the right side.

4.4.1.2 Value Formatting

Value Formatting is a very useful tool to round and abbreviate data.

The screenshot shows a configuration box for Value Formatting. It contains three main fields:

- Predefined formats:** A dropdown menu currently showing 'Standard (no format)'.
- Formatting formula:** A text input field.
- Units:** A text input field.

 A blue link labeled 'Documentation' is located to the right of the 'Formatting formula' field.

You can apply formats in the [Formatting formula field](#). Therefore, SAP Process Mining by Celonis 4.2 offers [Number Formats](#) and [Date Formats](#).

Furthermore, you can make use of our Predefined formats, using the drop-down menu:

The screenshot shows a dropdown menu titled 'Value formatting (choose predefined formats)'. The menu is open, displaying a list of predefined formats. The 'Rounded number (#,###)' option is currently selected and highlighted in blue.

- Rounded number (#,###) (selected)
- Standard (no format)
- Percentage (%)
- Decimal Number (#.##)
- Abbreviated (##.##k)
- Date (Y-M-D)
- Time (H:M)
- Timestamp (Y:M-D H:M)
- Date: year (Y)
- Date:year-month (Y-M)
- Date:year-month-day (Y-M-D)
- Custom Formula

If your formatting formula requires a unit (for example a currency), you can specify this in the *Units* field.

Number Formats

Number formatting uses the d3 [number format](#). You can use the following rules in your formula. The format specifier is modelled after Python 3.1's built-in format specification mini-language. The general form of a specifier is:

[fill][align][sign][symbol][width][,][.precision][type]

The available **type values** are:

type value	shortcut	description
exponent	e	uses Number.toExponential
general	g	uses Number.toPrecision
fixed	f	uses Number.toFixed
integer	d	uses Number.toString
rounded	r	rounds to [.precision] significant digits, padding with zeroes where necessary in similar fashion to fixed (f). If no precision is specified, it falls back to the general notation.
percentage	%	see fixed (f) but multiplies the value by 100 and adds a % suffix
rounded percentage	p	see percentage (%), but rounds to [.precision]
binary	b	displays the number in base 8
hexadecimal	x	displays the number in base 16, using <u>lower</u> -case letters for the digits above 9
hexadecimal	X	displays the number in base 16, using <u>upper</u> -case letters for the digits above 9
character	c	converts the integer to the corresponding Unicode character before printing
SI prefix	s	see rounded (r), but with an additional unit suffix (for example "9.5M" or "1.00μ")

The **align** can be:

align	description
<	aligned left
>	aligned right
^	central alignment

By default, > (aligned right) is selected.

The **prefix** can be:

prefix	description
+	this sign can be used for both positive and negative numbers
-	this sign can be used for both positive and negative numbers
<i>space</i>	a leading space (" ") should be used on positive numbers and a minus sign on negative numbers

The **symbol** can be:

shortcut	description
\$	adds the currency sign
#	for binary, octal or hexadecimal output, prefix
o	enables zero-padding

The width defines the minimum field width. If not specified, then the width will be determined by the content. The comma (,) option enables the use of a comma for a thousand separator. The precision indicates the number of digits to be displayed after the decimal point for a value formatted with types "f" and "%" or before and after the decimal point for a value formatted with types "g", "r", and "p".

Date Formats

Date formatting uses the [d3 time format](#).

shortcut	description
%a	abbreviated weekday name
%A	full weekday name
%b	abbreviated month name
%B	full month name
%c	date and time, as %a %b %e %H %M %S %Y
%d	zero-padded day of the month as a decimal number [01,31]
%e	space-padded day of the month as a decimal number [1,31], equivalent to %d
%H	hour (24h - clock) as a decimal number [00,23]
%I	hour (12h - clock) as a decimal number [01,12]
%j	day of the year as a decimal number [001,366]
%m	month as a decimal number [01,12]
%M	minute as a decimal number [00,59]
%L	milliseconds as a decimal number [000,999]
%p	either AM or PM
%S	second as a decimal number [00,61]
%U	week number of the year as a decimal number [00,53] (Sunday as the first day of the week)
%w	weekday as a decimal number [0,6] (Sunday as the first day of the week)
%W	week number of the year as a decimal number [00,53] (Monday as the first day of the week)
%x	date, as "%m%d%Y"
%X	time as %H%M%S
%y	year without century as a decimal number [00,99]
%Y	year with century as a decimal number
%Z	time zone offset, such as "-0700"
%%	a literal % character

4.5 PERMISSIONS

Permissions can be used to restrict the access of users (or user groups) to any project objects (analysis documents, data models, folders).

If you are new to SAP Process Mining by Celonis 4.2, we recommend to review the [Structure](#) of SAP Process Mining by Celonis 4.2, as we will use terms in this chapter, that are defined in the structure section.

SAP Process Mining by Celonis 4.2 comes with three user rights:

View	This is the "lowest" access right in the hierarchy. Users or groups with a <i>View</i> permission can access the object, but can't make any permanent changes to them. The available <i>View</i> rights for analysis documents are explained in the Viewer chapter.
Edit	Users or groups with an <i>Edit</i> right are granted permissions to edit this object. For analysis documents, they can access the <i>Edit Mode</i> (review this Analyst chapter for all available operations on analysis documents).
Create	<i>Create</i> permissions allow the user or the group to add such an object to this folder.

Please note, that permissions are always **downwards inherited**.

Let's examine a folder for an example:

Folder X consists of two analysis, one data model, and two subfolders Y and Z, each of them including again independent analysis and data models. If user A is granted *Edit* permissions on analysis for folder X, he is automatically granted *Edit* permissions for the two analysis in folder X, as well for all analysis that are included in the subfolders (Y and Z).

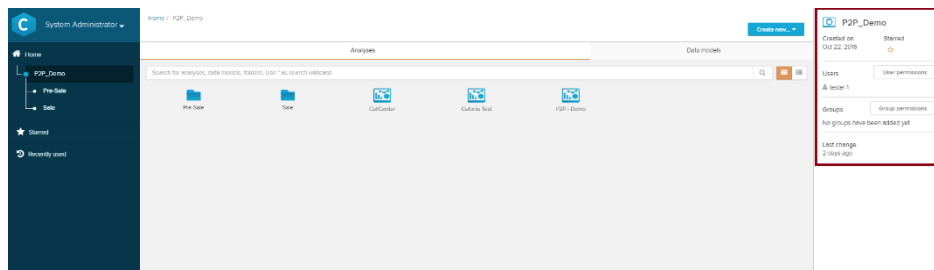
However, you can override the inheritance by manually editing the permissions for the subfolders. This also applies for *View* and *Create* rights. To edit these permissions, *Edit*-rights are required for the object, that is meant to be edited. Please also note the **Folder Admin** permission. This kind of permission is required to access the [Toolbar](#) of the folder and therefore to edit, copy/cut/paste and delete the folder.



Dealing with permissions, projects are seen as the *ROOT* folder of a project. For this reason, folder admin rights can be set for projects.

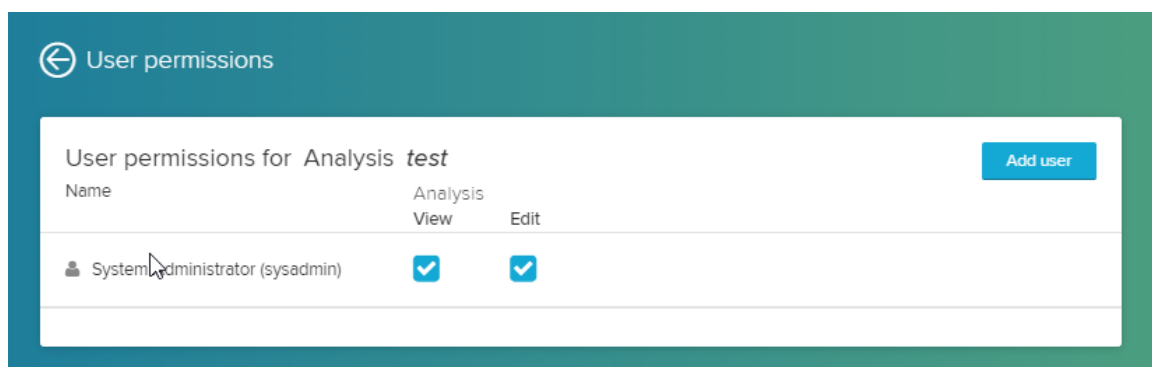
Set Permissions

Permissions for any objects are configured using the [Overview bar](#) on the right side of your Homescreen.



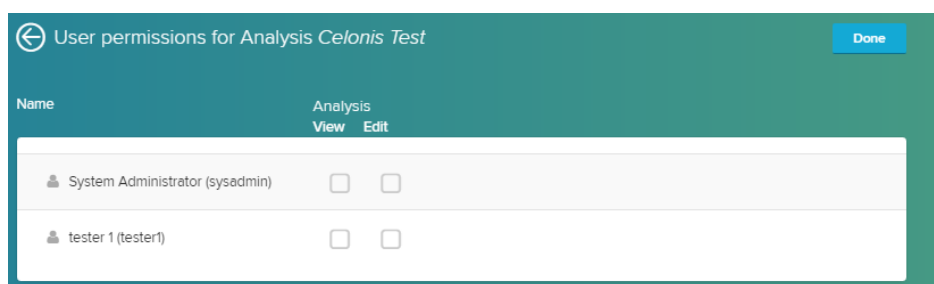
After selecting the desired object in the project browser, you will see the document's name in the project toolbar. Click on *User Permissions* or on *Group Permissions* to add or change permissions of a single user or a group.

Click on [User permissions](#) or on [Group permissions](#) to set the permissions.



Sample screenshot from a project called "SAP Process Mining by Celonis 4.2 Test".

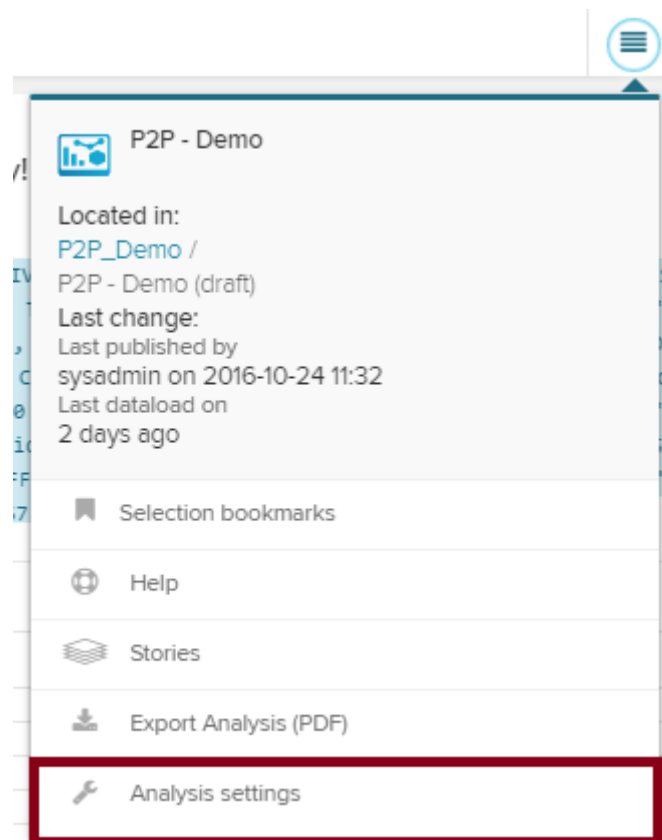
You can now set *View*, *Edit* and *Create* rights for Analysis and Data models, and furthermore grant *Folder Admin* rights. If you are editing permissions for a single analysis or a single data model, only permissions available for this single object are available:



If no users/groups have been added yet, use the [Add user](#) / [Add group](#) buttons in the upper right corner. Don't forget to save your settings with [Done](#).

4.6 ANALYSIS SETTINGS

Analysis Settings can be found in the [document tools](#).



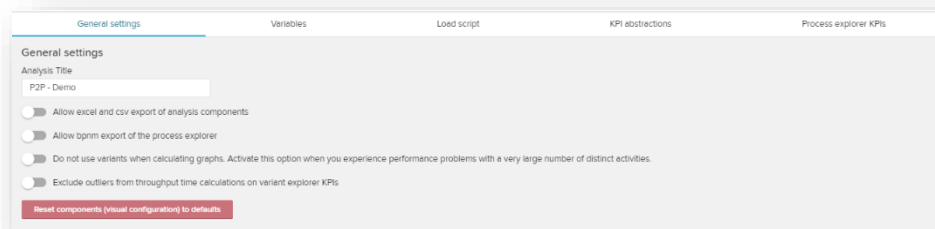
The following Settings are available:

- [General Settings](#)
- [Variables](#)
- [Load Script](#)
- [Process Explorer KPIs](#)

For each of them, a subchapter has been created in this manual.

4.6.1 GENERAL SETTINGS

The following general settings are available:

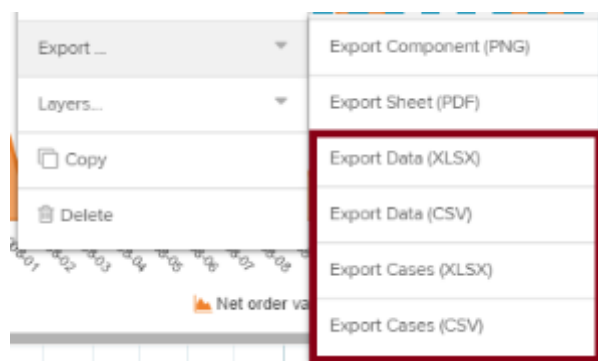


▼ Analysis Title

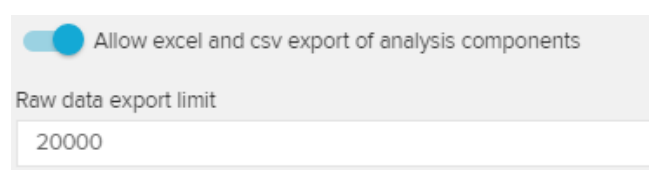
The analysis title is shown on the [Homescreen](#) in the project navigation.

▼ Excel / CSV Export

If you activate this option, users are allowed to download [Charts And Tables](#) components as a .csv or as a .xlsx file. Therefore, the following option will be added to the component menu (right-click on any component):



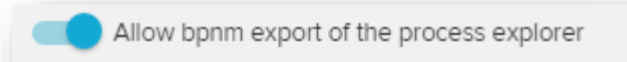
For each component, users can choose whether they want to export the cases or the data. Exporting data will generate a list that includes all aggregated values (= cases) by the component's KPIs. This is for example interesting, if you are only interested in the displayed data of a column chart. Exporting cases will export all cases with all column values of all existing cases. The generated file will most likely contain a huge amount of data. To limit the amount of exported data, you can set a *raw data export limit*. The generated file will not exceed the given number of rows (and might "cut" the data according to your component's sorting policy).



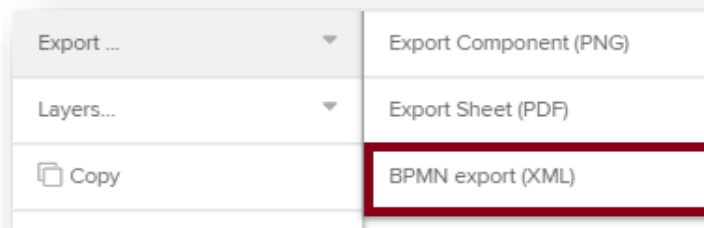
Keep your server's free disc-space in mind. If you allow your user to export millions of rows, your server needs to provide sufficient free disc-space to hold these files while they are generated.

▼ BPMN Export

You can export the [Process Explorer](#) as Business Process Model (BPMN).



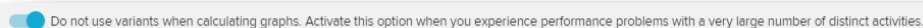
The following option will appear in the component menu of the process explorer.



▼ Do not use variants

If you activate this option, variants won't be regarded while calculating graphs (i.e. the Process Explorer).

For more information on variants, we recommend to read the section about the [Variant Explorer](#).



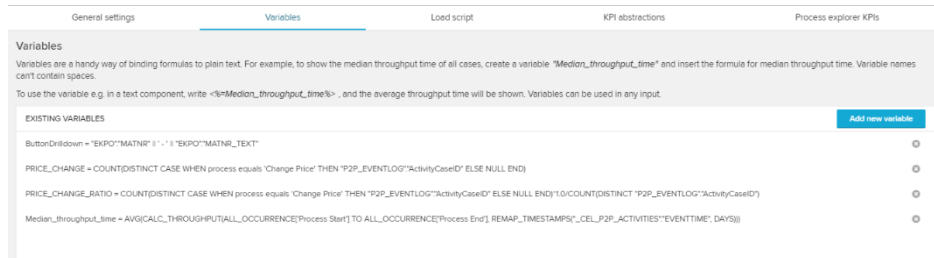
This can solve problems considering performance, if you are working with a large number of distinct activities.

The variant calculation is the most costly calculation which is done by SAP Process Mining by Celonis 4.2. For an eventlog with an extremely high number of distinct activities or an extremely high number of very long distinct variants it can bring a significant calculation advantage to avoid variants in the Process Explorer.

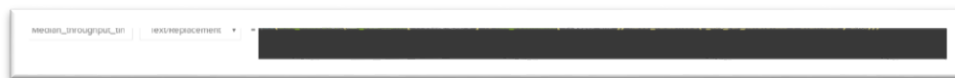
If you re-activate the variants, you have to reload the whole page (e.g. press F5) to trigger the variant-calculations again.

4.6.2 VARIABLES

Variables are a handy way of binding formulas to plain text. You can define variables to store specific values in this section.

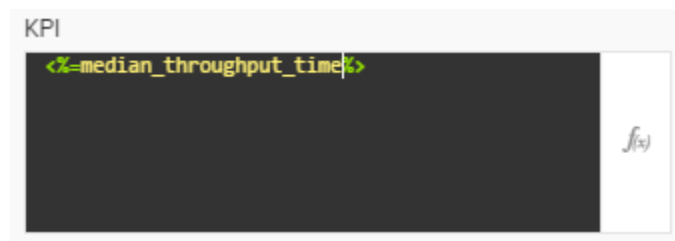


For example, to show the median throughput time of all cases, create a variable *Median_throughput_time* and insert the formula for median throughput time.



To address a variable in a component or formula, use the following syntax in *any* text field or input area throughout this analysis document:

`<%=Variable1%>`



Please note, that variable names can't contain spaces.

4.6.3 LOAD SCRIPT

The load script panel allows to create a document wide filters and predefine selections. The filter builder on the right side can be used to add columns from your database.

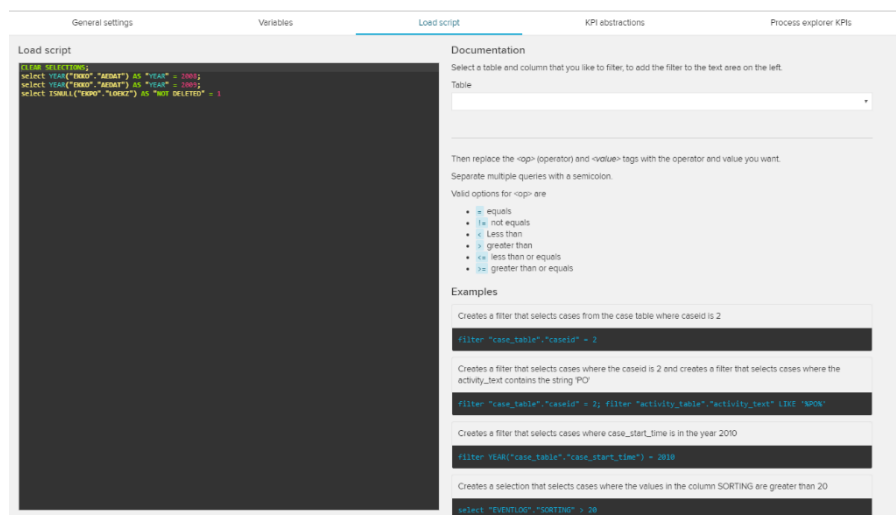
Filters can be set with the following syntax:

```
FILTER "Eventlog"."Sorting" > 4
```

Selections will be set like the following example:

```
CLEAR SELECTIONS; SELECT PINNED "Eventlog"."Sorting" AS "Sorting" > 4;
```

For more details on the use of load scripts see the [Filter](#) section. Load scripts are [Selections](#) that are valid for the whole analysis document. Therefore, the Analysis Settings provide this load script panel.



On the left side, you will see a text field, the **filter builder**. It can be used to apply custom selections on it, using [PQL Queries](#).

To help you, you can choose your tables and columns on the right side of the load script panel, using dropdown menus:

Table

EKPO

Column

STATU

_CASE_KEY

MANDT

EBELN

EBELP

LOEKZ

STATU

AEDAT

TXZ01

MATNR

EMATN

BUKRS

WERKS

LGORT

BEDNR

MATKL

INFNR

IDNLF

KTMNG

MENGE

MEINS

BPRME

COLUM7

Filter syntax:

On the right side of the load script panel, you can find a short tutorial as well as some examples for the filter syntax:

Examples

Creates a filter that selects cases from the case table where case id is 2

```
filter "case_table", "caseid" = 2
```

Creates a filter that selects cases where the case id is 2 and creates a filter that selects cases where the activity_text contains the string FO

```
filter "case_table", "caseid" = 2; filter "activity_table", "activity_text" LIKE "FO"
```

Creates a filter that selects cases where case_start_time is in the year 2010

```
filter "case_table", "case_start_time" = 2010
```

Creates a selection that selects cases where the values in the column SORTING are greater than 20

```
select "EVENTS", "SORTING" > 20
```

Creates a selection that selects cases where EVENTTIME is in the year 2013 and following

```
select "EVENTS", "EVENTTIME" > 2013
```

Creates a pinned selection (can not be removed) selection that selects cases where the throughput time between Source activity name and Target activity name is between 2 and 3 hours

```
select joined ("all_throughput_time_occurrence", "source_activity_name" to "target_occurrence" ("target_activity_name", "time_difference_table", "event_time", "source_occurrence_id" and "target_occurrence_id"))
```

Creates a pinned selection (can not be removed) selection that selects cases where USER_TYPE equals 'Batch'

```
select joined "EVENTS", "USER_TYPE" = "Batch"
```

4.6.4 SAVED FORMULAS

The saved formulas allow the analyst to save his custom created PQL statements for later use. You can either directly create a formula in the saved formula section in the analysis settings or directly save a formula from within the Visual PQL Builder. To create a new saved formula you can set the formula's title (1), set a description (2) which will be shown in the PQL reference to the saved formula and put in the PQL statement (3).

The screenshot shows the 'Analysis settings' window with the 'KPI abstractions' tab selected. On the left, there is a list of KPI abstractions, including 'KPI Abstraction 1'. On the right, the details for 'KPI Abstraction 1' are shown. The form includes a 'Name' field (1) with the value 'KPI Abstraction 1', a 'Description' field (2) with the value 'KPI Abstraction Description', a 'Parameters' section (4) with an 'Add parameter' button, and a 'KPI Template' section (3) containing a PQL statement: `COUNT('Eventlog', 'CaseID')`. A 'Remove' button is located at the top right of the form.

Additionally, you can specify parameters (4) which will function as placeholders within your PQL statement. With the syntax `<{p1}>` the parameter can be inserted in the PQL code. A parameter can then be edited by the analysts who will re-use the saved formula. For example, a parameter which allows the user to choose an activity name will allow an analyst to use the same saved formula for a KPI on different activities.

There are several parameters that can be used:

- **Column:** This parameter allows the user to input a column in the Visual Code Editor. You can choose which column is set automatically when first adding the abstraction to a component to be: The Case_id, Activity Column, Timestamp or End Timestamp Column.
- **Table:** This parameter allows the user to input a table in the Visual Code Editor. You can choose if no table, the Case table or the Activity table will be set by default when first adding the abstraction to a component.
- **Activity name:** For this parameter, the user can choose from the activity names of the process in the Visual Code Editor.
- **Text:** The text parameter adds a text block to the Visual Code Editor and allows the users to input plain text to the KPI Abstraction.

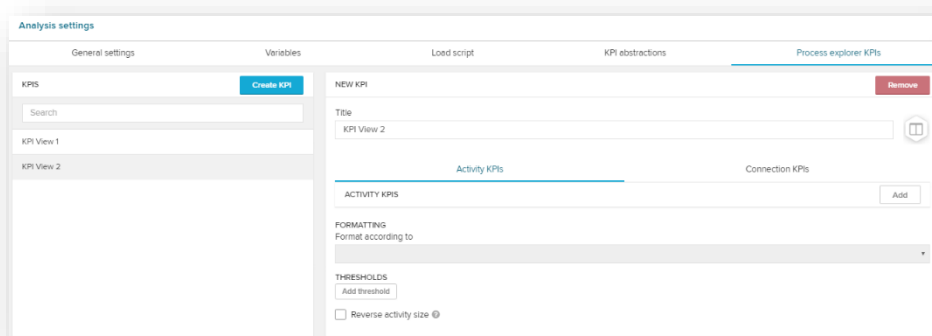
- **Integer** The integer parameter adds an integer block to the Visual Code Editor and allows the users to input plain integer to the KPI Abstraction.
- **Decimal**: The decimal parameter adds a decimal block to the Visual Code Editor and allows the users to input plain decimal to the KPI Abstraction.
- **Date and Time**: The date and time parameter adds a date block to the Visual Code Editor and allows the users to input a date and time to the KPI Abstraction.
- **Condition**: The condition parameter adds a block to the Visual Code Editor which allows the user to specify a certain condition. For example, the condition in a case when statement can be input flexibly with this parameter:

Saved formulas can be found in the list of the Standard Process KPIs of the Data Chooser and Code Editor and the KPI Library of the PQL Builder.

4.6.5 PROCESS EXPLORER KPIS

In this section, you can configure your [Process Explorer KPIs](#).

KPIs that are created here, will be visible in the [Process Explorer](#) and can be accessed using [this description](#).

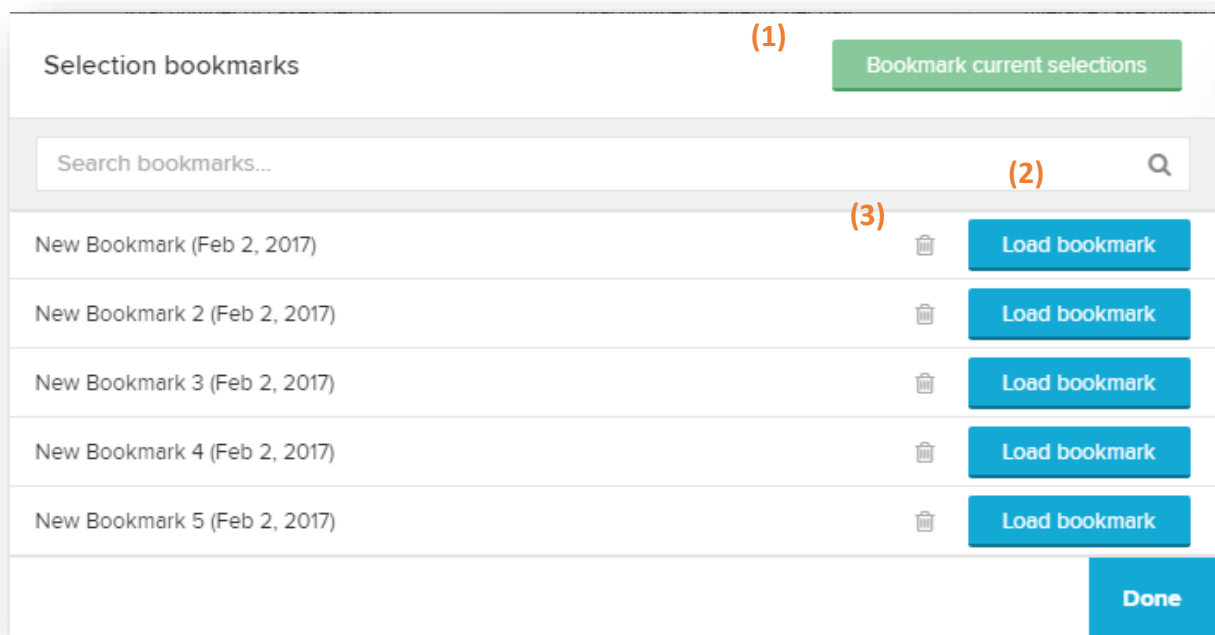


4.6.6 BOOKMARKS

Bookmarks can store the current analysis state for later use. A bookmark will store the current selections, variable states and other user configurations like the sorting of a table. Every user can create and save as many bookmarks as he wishes to save findings of an analysis.

To create a new bookmark, you can access the bookmark's section at the top right of the analysis and create a new bookmark by simply clicking on the button "new bookmark" (1).

An existing bookmark can be loaded by clicking on 'Load bookmark' (2) or deleted by clicking on the delete icon (3).

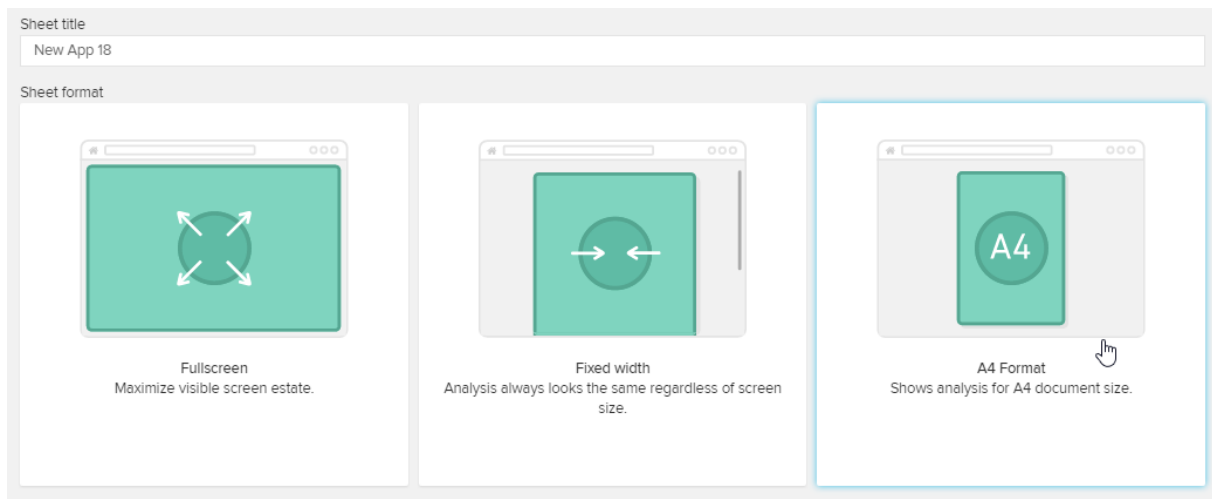


4.6.7 ANALYSIS EXPORT

The analysis export in the analyses settings's dropdown will export all analysis sheets into one PDF document:

 **Export Analysis (PDF)**

On analyses that will be exported very frequently, for an optimal export result, we recommend to switch the sheet size to A₄ format:



5 DATA SCIENTIST

A Data Scientist is responsible for the data, that are used in SAP Process Mining by Celonis 4.2 to create the analysis documents.

This chapter describes the process to **integrate data** to SAP Process Mining by Celonis 4.2, and explains how to create a **data model**.

What's Inside?

[Data Model](#)

[Data Integration](#)

[Event Log](#)

This chapter will start with a short description of a data model. In the second part, the data integration process is described in detail. The third part focuses on the data model configuration, to meet your requirements.

If you have never worked with data models before, we recommend to start here: [Data Model](#).

If you want to go ahead and integrate your data, follow this tutorial: [Data Integration](#)

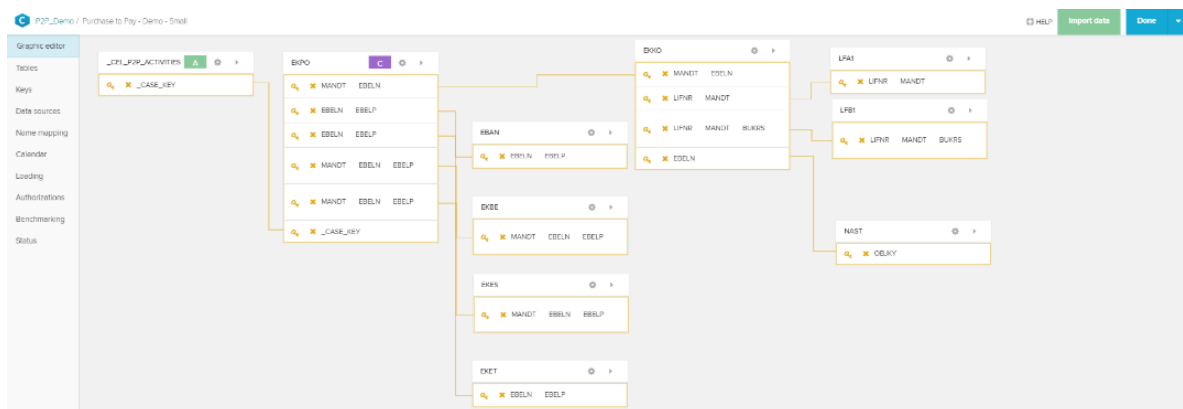
Through the whole process, the **Navigation** area will remain, and offers a quick navigation between the available configuration options.

5.1.1 DM: GRAPHIC EDITOR

The Graphic Editor is the base for any operations that are performed with the data in your data model. It gives you a graphical map of all tables with their **foreign-key relations**, which link the single tables of a data model together.

You can move the tables with Drag & Drop (their relations won't be affected).


To use the tables for an analysis in SAP Process Mining by Celonis 4.2, you need to define relations by using primary - and foreign keys.














As an example, we displayed the relations between the activity table and the case table. As you can see in the following screenshot, they are placed next to each other for now.

To search for a key column, use the **search field**.

One **activity table** will have an **A** icon and the **case table** will show the **C** icon.

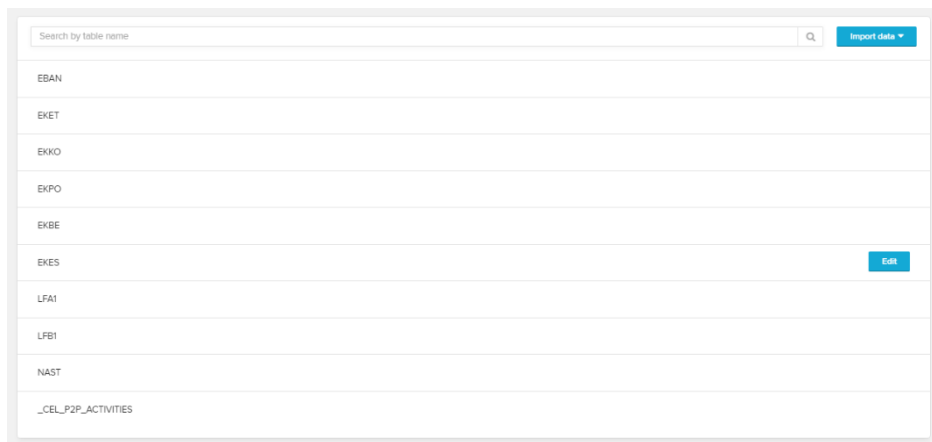
You can furthermore use the  icon to access the **table's settings** and configure it's columns.

expand/collapse the table with  to see all available columns and to graphically assign foreign keys.

 _CASE_KEY	
 MANDT	
 EBELN	
 EBELP	
 LOEKZ	

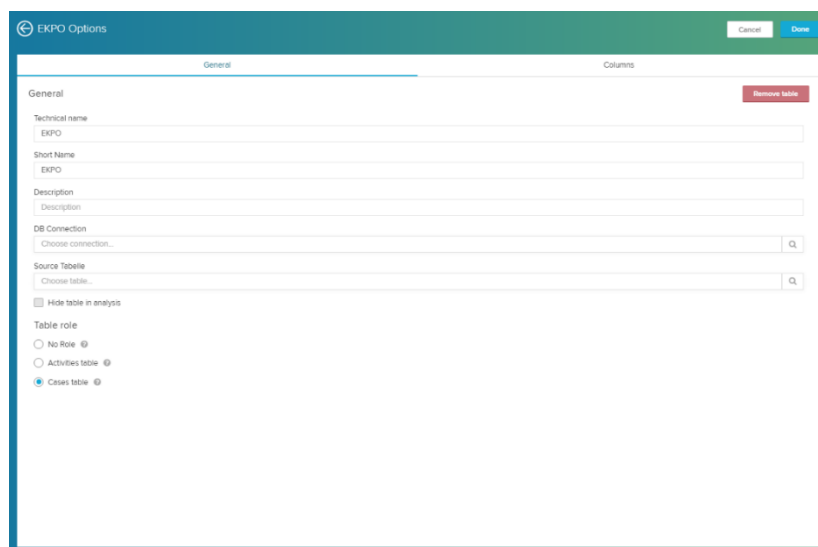
5.1.2 DM: TABLES

The tables section offers a list of all included tables in your data model.



Search by table name	Import data
EBAN	
EKET	
EKKO	
EKPO	
EKBE	
EKES	Edit
LFA1	
LFB1	
NAST	
_CEL_P2P_ACTIVITIES	

Click on this button, to access the table settings:



EKPO Options
Cancel
Done

General
Columns

Remove table

Technical name

Short Name

Description

DB Connection

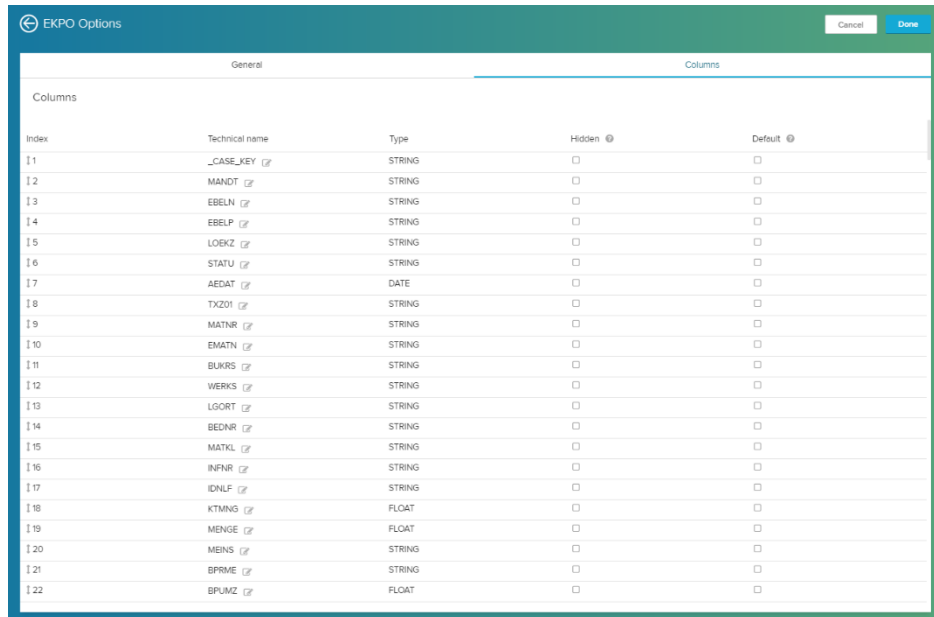
Source Tabelle

☐ Hide table in analysis

Table role
☐ No Role
☐ Activities table
☒ Cases table

You can **rename** the table, add a **description**, reconfigure its **connection** or even hide the table in your Analysis.

Click on *Columns* to edit the table's columns.



Index	Technical name	Type	Hidden	Default
11	_CASE_KEY	STRING	<input type="checkbox"/>	<input type="checkbox"/>
12	MANDT	STRING	<input type="checkbox"/>	<input type="checkbox"/>
13	EBELN	STRING	<input type="checkbox"/>	<input type="checkbox"/>
14	EBELP	STRING	<input type="checkbox"/>	<input type="checkbox"/>
15	LOBKZ	STRING	<input type="checkbox"/>	<input type="checkbox"/>
16	STATU	STRING	<input type="checkbox"/>	<input type="checkbox"/>
17	AEDAT	DATE	<input type="checkbox"/>	<input type="checkbox"/>
18	TXZ01	STRING	<input type="checkbox"/>	<input type="checkbox"/>
19	MATNR	STRING	<input type="checkbox"/>	<input type="checkbox"/>
110	EMATN	STRING	<input type="checkbox"/>	<input type="checkbox"/>
111	BUKRS	STRING	<input type="checkbox"/>	<input type="checkbox"/>
112	WERKS	STRING	<input type="checkbox"/>	<input type="checkbox"/>
113	LGORT	STRING	<input type="checkbox"/>	<input type="checkbox"/>
114	BEDNR	STRING	<input type="checkbox"/>	<input type="checkbox"/>
115	MATKL	STRING	<input type="checkbox"/>	<input type="checkbox"/>
116	INFNR	STRING	<input type="checkbox"/>	<input type="checkbox"/>
117	IDNLF	STRING	<input type="checkbox"/>	<input type="checkbox"/>
118	KTMING	FLOAT	<input type="checkbox"/>	<input type="checkbox"/>
119	MENGE	FLOAT	<input type="checkbox"/>	<input type="checkbox"/>
120	MEINS	STRING	<input type="checkbox"/>	<input type="checkbox"/>
121	BPRIME	STRING	<input type="checkbox"/>	<input type="checkbox"/>
122	BPUMZ	FLOAT	<input type="checkbox"/>	<input type="checkbox"/>

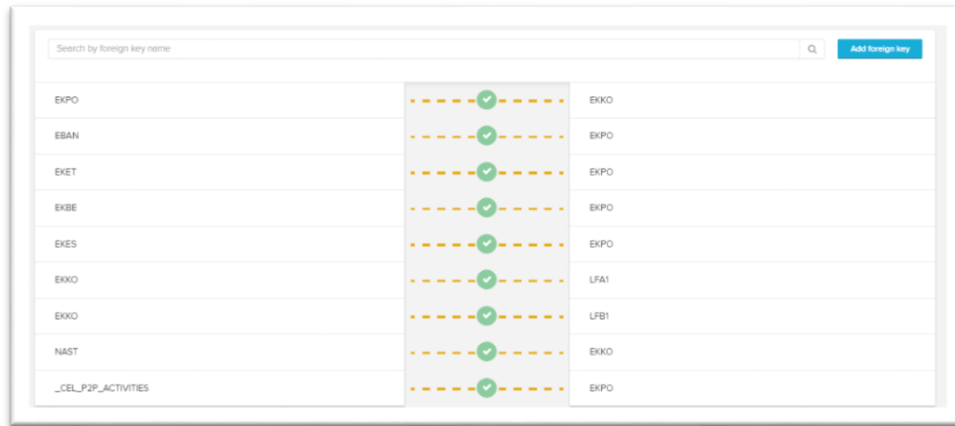
You can tag each column with two Attributes: **Hidden** and **Default**.

- **Hidden** – The column won't appear in any Analysis that is created using this Data Model.
- **Default** – The column will be applied automatically to the initial view of the Case Viewer.

This is of special interest if you are using a table with a large amount of entries, and would like to structure your initial Analysis.

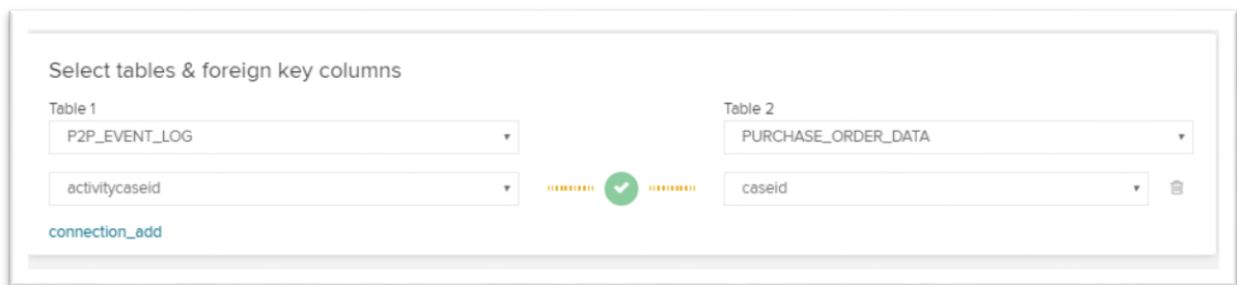
5.1.3 DM: KEYS

Foreign keys are required for your data model to work sufficiently.

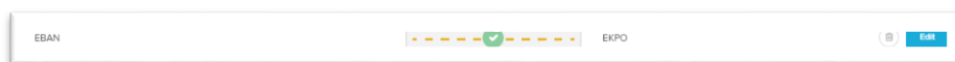


By clicking on **ADD FOREIGN KEY**, new foreign keys can be generated.

To do so, select the tables in the first line's dropdowns. After a click on **ADD FOREIGN KEY** a new selection possibility for the table's columns will appear in the next line. Select the columns that should be used for the foreign key relationship. Multiple columns for the foreign key relationship can be chosen here.

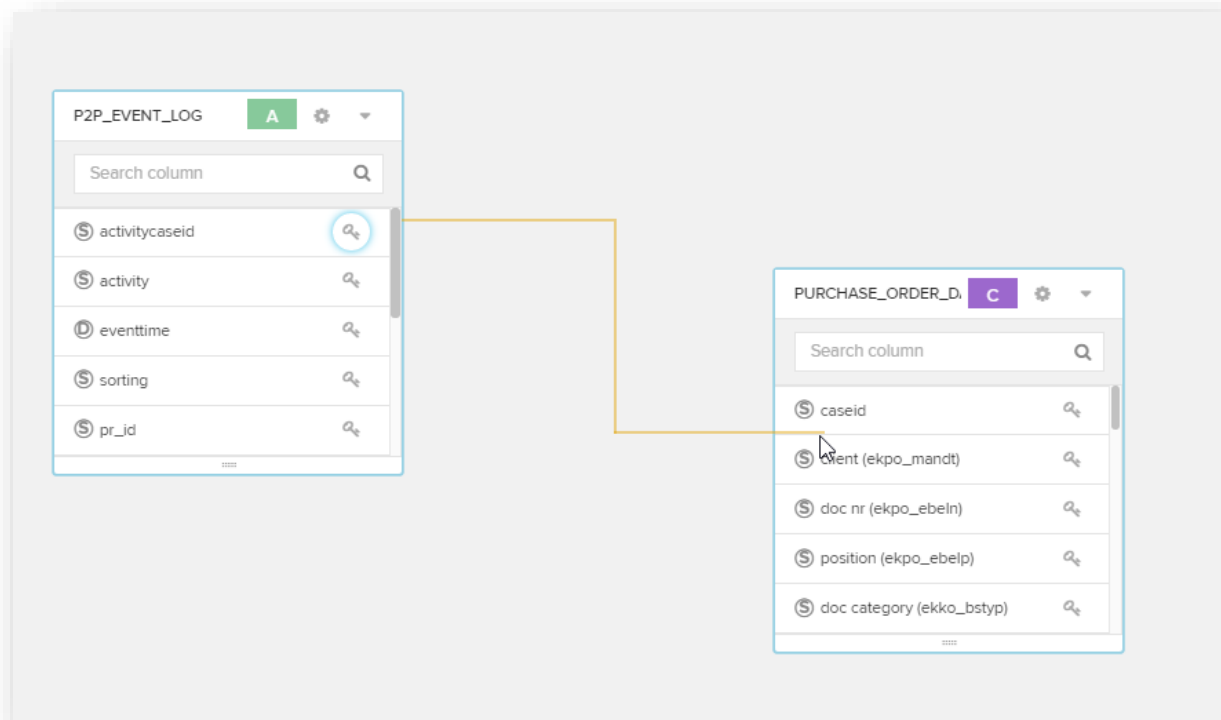


Keep in mind that only 1:N relationships between tables will result in a working data model. To edit or delete an already existing foreign key, click on the hover-buttons:



Define Keys in the Graphic Editor

Click and hold the left mouse button on the key - symbol of your desired key column in the [Graphic Editor](#) (here: *num_id* in the *Activities Table*) to establish a connection to the key of the other table (here: *case_num_id*), by moving the mouse to the key symbol.



5.1.4 DM: NAME MAPPING

The name mapping allows you to enable translations for technical and language specific terms.

It is possible to use translation tables from **databases** or use an **excel template** and edit it on your local machine.

What's name mapping?

Often source systems (such as SAP) have table and column names that are not immediately obvious. Use name mapping to rename these technical names to a human friendly format. For example EKIO => Purchasing Document Header.

Name mapping status

☐ Name mapping is turned off

Name mapping from file [Download template](#)

Download a template file (xlsx) prefilled with your table and column names. Write down the human friendly version of those names. Upload the file back here and you're done!

Drag & drop a file here or

[Select file](#)

Name mapping from database table

Some source systems - such as SAP - come with name mapping information included as part of the system. To use these, connect to the database and select the tables and columns containing name mapping information.

Table name mappings

Database Connection:

Table name mappings are in table:

Technical names column:

Pretty names column:

Language key column:

[Add mapping](#)

Column name mappings

Database Connection:

Column name mappings are in tables:

Table names column:

Technical names column:

Pretty names column:

Language key column:

[Add mapping](#)

To enable the name mapping on a data model, switch on the toggle:

Excel Upload

The name mapping provides the possibility to download a template for your current data model and its tables. In this template, you can specify translations for every technical name of your tables and columns.

Download template

First, you need to **download** the template with the button.

A xlsx file will be stored on your local hard drive. Open this file in any table editor (for example, use Excel). Edit the *Translation* column of this file, and save it on your local hard drive.

	A	B	C	D	E
1	TABLE_NAME	LANGUAGE_KEY	TRANSLATION	DESCRIPTION	Entries in the TRANSLATION column will replace the TABLE_NAME in your analysis.
2	EBAN	D	Bestellanforderung		
3	EBAN	d	Zahtev za nabavku		
4	EBAN	E	Purchase Requisition		
5	EKET	D	Lieferplaneinteilungen		
6	EKET	d	Plan isporuke - podele		
7	EKET	E	Scheduling Agreement Schedule Lines		
8	EKKO	D	Einkaufsbelegkopf		
9	EKKO	d	Zaglavlje dokumenta nabavke		
10	EKKO	E	Purchasing Document Header		
11	EKPO	D	Einkaufsbelegposition		
12	EKPO	d	Stavka dokumenta nabavke		
13	EKPO	E	Purchasing Document Item		
14	EKBE	D	Historie zum Einkaufsbeleg		
15	EKBE	d	Istorija po dokumentu nabavke		
16	EKBE	E	History per Purchasing Document		
17	EKES	D	Bestellbestätigungen		
18	EKES	d	Potvrde dobavljača		
19	EKES	E	Vendor Confirmations		
20	LFA1	D	Lieferantenstamm (allgemeiner Teil)		
21	LFA1	d	Lista dobavljača (opšti odabir)		
22	LFA1	E	Vendor Master (General Section)		
23	LFBI	D	Lieferantenstamm (Buchungskreis)		
24	LFBI	d	Lista dobavljača (zifra kompanije)		
25	LFBI	E	Vendor Master (Company Code)		
26	NAST	D	Nachrichtenstatus		
27	NAST	d	Status poruke		
28	NAST	E	Message Status		
29	_CEL_P2P_ACT	D			
30	_CEL_P2P_ACT	d			
31	_CEL_P2P_ACT	E			

To apply your changes, you need to **upload** the new template.

Database Table

It is possible to define a name mapping with the **dictionary table** in a database. On every data load of the data model the name mapping will be updated automatically and load all translations available to your data model's tables and its columns.

Please Note:

Your dictionary table should include (at least) a column with technical table names (i.e. EBAN), a column with the translation (i.e. Purchase Requisition) and a column for the language key (i.e. E for English).

To apply the name mapping for table names from a database table, use the dropdown-menus. Start with choosing the corresponding database connection and the table's name in the *Table name mappings*. Continue by selecting the above listed columns in the *Column name mappings*.

Name mapping from database table

Some source systems - such as SAP - come with name mapping information included as part of the system. To use these, connect to the database and select the tables and columns containing name mapping information.

Table name -mappings

Database connection

Dictionary

Table name -mappings are in table

DD02T

Technical names -column

TABNAME

Pretty names -column

DDTEXT

Language key -column

DDLANGUAGE

Add mapping

Column name -mappings

Database connection

Dictionary

Column name -mappings are in table

DD03M_minisep

Table names -column

TABNAME

Technical names -column

FIELDNAME

Pretty names -column

DDTEXT

Language key -column

LANGFLAG

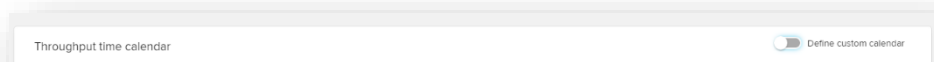
Add mapping

To apply the name mapping with the chosen database connection, click on apply.

5.1.5 DM: CALENDAR

SAP Process Mining by Celonis 4.2 provides two calendars:

Throughput Time Calendar

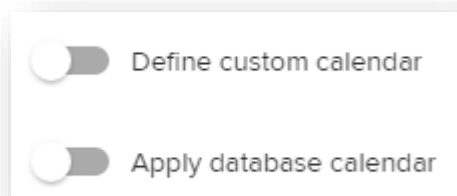


This calendar defines which days and working hours to take into consideration in any throughput time calculation of the associated analysis documents. For accurate throughput times, we recommend to define the working hours and days according to your company policy.

Factory Calendar



Use this calendar to determine the workdays between to dates. To activate (or deactivate) any of these calendars, use the toggles at the right side:



After the configuration of any calendar, the `WORKDAYS_BETWEEN` function will be available in the [Process Explorer](#), the [Variant Explorer](#) as well as in the [Process Explorer KPIs](#).

5.1.5.1 Throughput Time Calendar

To actually define your working days without a database triggered calendar, use the throughput time calendar to manually define your working days to be considered in any throughput time calculation.

Data model calendar defines which days and working hours to take into consideration in throughput time calculation. For accurate throughput times, define the working hours and days at your company.

Choose preset ▼

Working days & Hours

<input type="checkbox"/> Monday	00:00	24:00
<input type="checkbox"/> Tuesday	00:00	24:00
<input type="checkbox"/> Wednesday	00:00	24:00
<input type="checkbox"/> Thursday	00:00	24:00
<input type="checkbox"/> Friday	00:00	24:00
<input type="checkbox"/> Saturday	00:00	24:00
<input type="checkbox"/> Sunday	00:00	24:00

You can either manually select the days and specify working hours or choose pre-defined **templates** using the dropdown menu:

Choose preset ▼

Choose preset

- All days, 24/7
- None
- Mo-Fr
- 08:00 - 16:00
- 08:00 - 17:00
- 09:00 - 17:00
- 09:00 - 18:00

5.1.5.2 Factory Calendar

The factory calendar is there to define working days, based on your data source.

Throughputtime calendar

Factory calendar

☒ Apply database calendar

In order to be able to determine the workdays between two dates, you can define a factory calendar here.

Choose database: test p2p demo

Choose calendar table: tfacs

Choose calendar ID column: calid

Required calendar table structure

Calendar ID (String)	Year	Month 1	Month 2
01	2015	01111000111010	01111000111010
02	2015	01111000111010	01111000111010

Choose column with calendar IDs from case table: W6: ENP01

Done

Please complete the following 4 steps, using the offered dropdown-menus.

1. Choose a database that includes your time specification.
2. Choose the calendar table from your database.
3. Choose the column of the calendar ID in the calendar table.
4. Choose the calendar ID from the case table.

5.1.6 DM: LOADING

In this loading section, you can configure the loading process of your data model.

This is especially important, as it might have a significant impact on the performance while loading and/or interacting with any associated analysis document.

The screenshot shows a configuration window for the data model loading process. It is divided into three main sections:

- Cache retention:** Includes a description: "You can configure how long entries should be kept in the hot-cache when they are not use. Higher usually means better performance but higher memory usage. A default value is 60 minutes. Note that you have to reload the data model for the setting to become active." Below this is a text input field labeled "Retention time in minutes" with the value "60". A "Save retention" button is in the top right corner.
- Load scheduling:** Includes a checkbox labeled "Activate automatic re-loading". An "Update schedule" button is in the top right corner.
- Load on demand:** Includes a description: "On 'demand loading' allows you to speed up the load of data model significantly. In order to successfully load a column on demand you need to specify the primary key of the table. Also you should keep in mind that a load on demand is a heavy operation. So you should activate 'on demand loading' for columns which you most likely don't need or need only in rare cases." An "Add table to load on demand" button is in the top right corner.

Cache retention

The cache retention time is the amount of time, that data is stored on your local hard drive, when they are currently not used by any active component.

A higher retention time will therefore increase the memory usage, therefore increases the performance of the loading process, as the data model can rely to a greater portion on data that has been stored on your computer.

By default, the cache retention rate is set to 60 minutes.

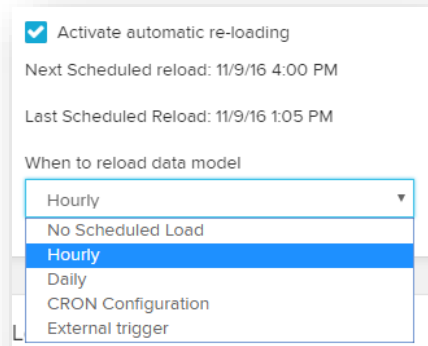
A close-up of the "Retention time in minutes" input field. The text "Retention time in minutes" is displayed above the input box, which contains the number "60".

Don't forget to save your settings with

Save retention

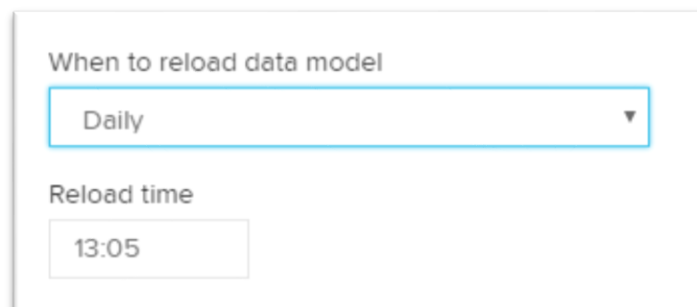
Load scheduling

With this feature, you can automatically reload your data model, according to a specified **schedule**. Use the dropdown menu to choose between an hourly, daily, cron or external trigger schedule.



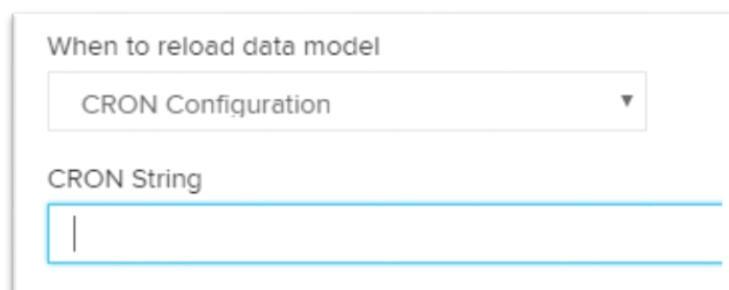
☒ Activate automatic re-loading
 Next Scheduled reload: 11/9/16 4:00 PM
 Last Scheduled Reload: 11/9/16 1:05 PM
 When to reload data model
 Hourly
 No Scheduled Load
 Hourly
 Daily
 CRON Configuration
 External trigger

If you choose a **daily schedule**, you can furthermore define a reload time.



When to reload data model
 Daily
 Reload time
 13:05

If you choose a **CRON configuration**, you can enter your CRON statement.



When to reload data model
 CRON Configuration
 CRON String
 |

CRON Tutorial:

A CRON statement is a great way to define a custom periodical trigger statement. If you have never worked with CRON before, start with our [CRON-Tutorial \(EN\)](#).

External trigger

You can use a triggered schedule dictated by a connected database. This is very useful when you have integration processes running outside of the software.

An example would be:

- Execute your data preparation steps in an external database
- At the end of your processing, write a record to a defined database table (e.g. RELOAD_LOG) using a query like:

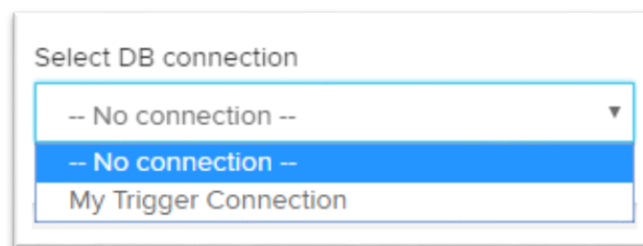
```
INSERT INTO RELOAD_TRIGGER_TABLE (Data_Model_Name, Reload_Request_Time) VALUES ('My_Data_Model', now())
```

- In the following configuration dialog, you can specify a database connection as well as a query for determining if a reload should be executed.

A sample table schema for reload triggering can be created using the following **DML statement** in a database:

```
CREATE TABLE RELOAD_TRIGGER_TABLE (
  DATA_MODEL_NAME VARCHAR(100), -- choose this column as data model name
  RELOAD_REQUEST_TIME TIMESTAMP, -- choose this column as reload request date column
  RELOAD_START_TIME TIMESTAMP, -- choose this column as reload start date column
  RELOAD_SUCCESS_TIME TIMESTAMP, -- choose this column as reload finished date column
  RELOAD_MESSAGE VARCHAR(500) -- choose_column_reload_message
)
```

Choose your database connection in the dropdown menu:



Select DB connection

- No connection --
- No connection --
- My Trigger Connection

Save your settings with

Update schedule

5.1.7 DM: AUTHORIZATIONS

In this section, you can link previously created authorization objects to your data model. Authorization Objects are explained in detail in the [Authorizations](#) section.


5.1.8 DM: STATUS

Your data model is made of data, that is stored in your data source. To be used in your analysis, each data model (that is required by an analysis) is loaded by starting a process.

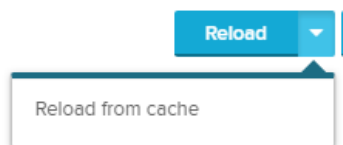
This process is responsible for the connection between your local SAP Process Mining by Celonis 4.2 instance and the data source.

You can restart this process by **reloading** your data model.

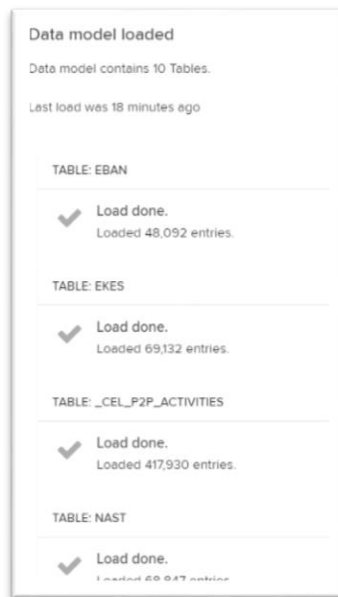
Use the  button.

To stop this process, use the  button.

However, this process is independent from any data, that is stored in your local cache. If you reload/unload your data model, your cache won't be affected. However, you can reload your data model from your cache with this function:



Furthermore, this section provides an overview of all available tables, that are included in your data model.



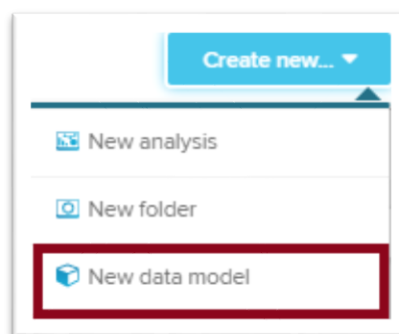
5.2 DATA INTEGRATION

The whole Data Integration process aims at creating a [Data Model](#), that is ready to use for your analysis document. This section is therefore designed to be a tutorial, that can easily be followed by with your own data! After you completed a step, you can proceed to the next step with the [Next](#) button.

5.2.1 NEW DATA MODEL

01 - Create A New Data Model

Create a new data model in your project navigation.



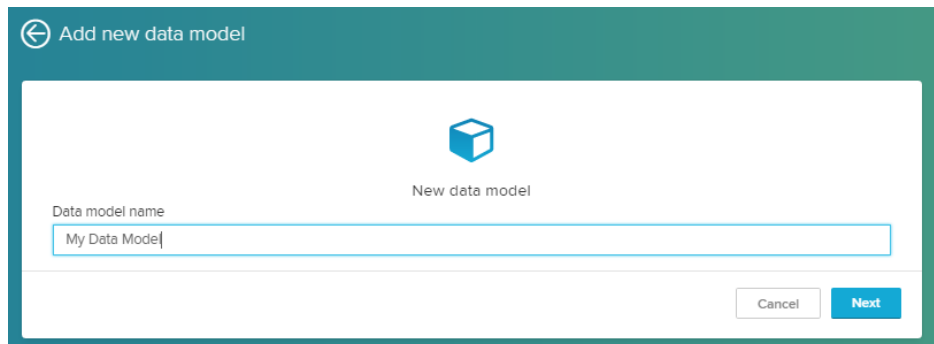
If you are in the data model section in your project navigation, use the

New data model

button in the upper right corner.

02 - Name Your Data Model

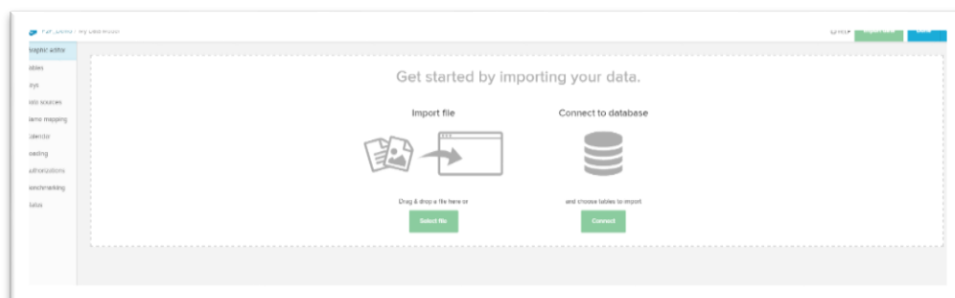
Assign a unique name to your data model. This name will appear in the project navigation.



03 - Import Your Data

At this point, you will be redirected to the **Graphic editor**. This is the central navigation base to edit your data model.

You can access all configurations that will follow again to edit your data model.



In the next step, we will connect your SAP database.

5.2.1.1 Database Connection

04 /1 - Connect A Database

You can either choose an existing database or create a new connection.

Define A New Database Connection

To define a new connection, click on [NEW DB CONNECTION](#) and define the connection properties.

Please provide all details to your database in this section:

Name

Enter a name for your data source. This name will also appear in the list of existing data sources.

Connection String

This is a string for the connection details of your database. By choosing a connection template, this will be filled out automatically, and you only need to adapt the wildcards.

User name & Password

Please provide a valid user name and its password for your database.

Schema Name

Enter the name of the database schema, which contains the data that you want to use.

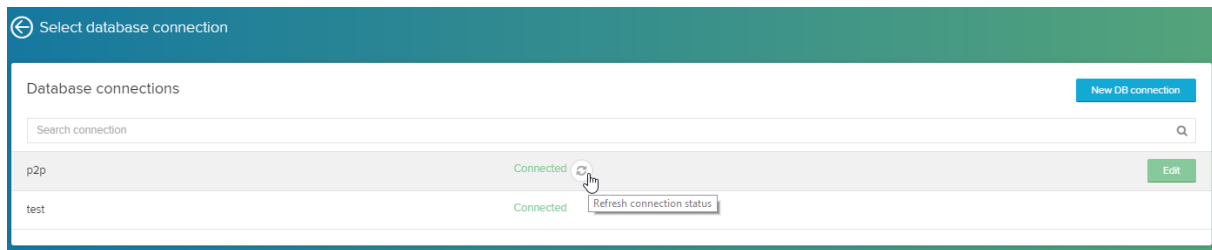
Driver Name

Enter the correct driver name. If you choose a connection template, this is filled out automatically. Usually, you don't need to add anything here within a connection template.

After confirming with **DONE**, the newly created connection will appear in the list of your existing data sources.

After you added a new connection, your data source will be marked if it is connected (however, this may take a moment, so don't worry if it doesn't appear immediately).

To **test** the database connection, click on *Refresh connection status*:



Click on **EDIT** to configure an already existing connection.

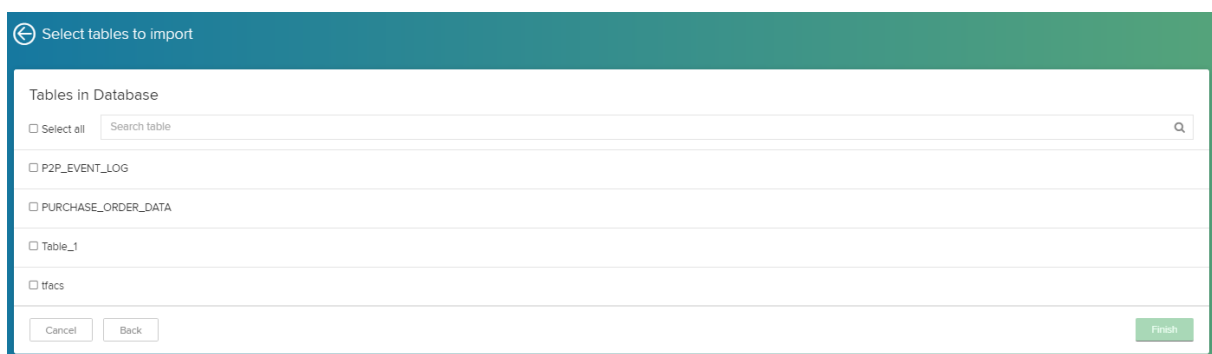
Select an Existing Data Source

An already existing database connection can be selected by simply clicking on the list entry.

04 /2 - Table Selection

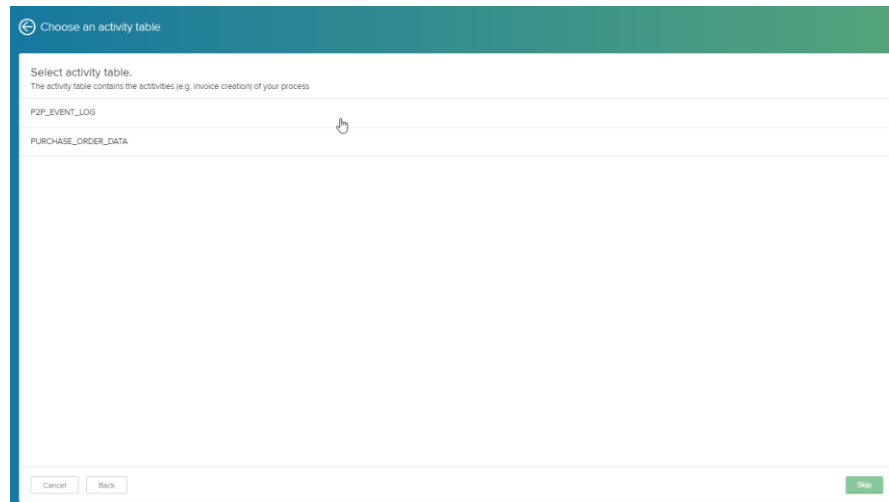
Use the provided checkboxes to select the tables, that you wish to import.

You must select *at least* one table. However, for a sufficient analysis document, you will most likely require at least two tables, a case table and an activity table (read more about tables [here](#)).



04 /3 - Choose the Activity Table

The activity table includes all activities, and is required by any component in the analysis document.



The screenshot shows a dialog box titled "Choose an activity table" with a back arrow icon. Inside the dialog, there is a section titled "Select activity table." with a subtitle "The activity table contains the activities (e.g. invoice creation) of your process". Below this, there is a list of two activity tables: "P2P_EVENT_LOG" and "PURCHASE_ORDER_DATA". A mouse cursor is hovering over the "P2P_EVENT_LOG" entry. At the bottom of the dialog, there are three buttons: "Cancel", "Back", and "Save".

Activity Table
P2P_EVENT_LOG
PURCHASE_ORDER_DATA

5.2.2 CONFIGURE DATA MODEL

05 - Assign Process Information

To generate a working process model, you have to provide the three mandatory eventlog configurations. The column containing the Case ID, Activities and the Event time have to be chosen by a simple click. Those three columns are sufficient to start Process Mining on the data model.

For more information on tables, consult the [Tables](#) chapter. For further specification, a sorting and end-timestamp column can be specified:

Map activity table columns

For Process Mining to function, we need to find out which columns contain the necessary data.

1/5 Select Case ID column
Click on the column that contains your case IDs. Case ID is a usually a numeric value that is unique and identifies each case in your process.

activitycaseid	activity	eventtime	sorting	pr_id	po_id	ir
44516250125954512240154057...	Goods Receipt	2012-07-07 07:01:45.0	5			
44516250125954512240154057...	Invoice booking	2012-07-12 13:43:35.0	8			
44516250125954512240154057...	Payment	2012-07-13 10:01:40.0	14			
44516250125954512240154057...	Create Purchase Order	2012-06-29 00:00:00.0	3		44516250125954512240164057...	
44516250125954512240164057...	Goods Receipt	2012-07-07 07:01:45.0	5			
44516250125954512240164057...	Scan Invoice	2012-07-12 08:25:35.0	7			
44516250125954512240164057...	Invoice booking	2012-07-12 13:43:35.0	8			
44516250125954512240164057...	Payment	2012-07-13 10:01:40.0	14			
44516250125954512240174057...	Create Purchase Order	2012-06-29 00:00:00.0	3		44516250125954512240174057...	
44516250125954512240174057...	Goods Receipt	2012-07-07 07:01:45.0	5			
44516250125954512240174057...	Scan Invoice	2012-07-12 08:25:35.0	7			
44516250125954512240174057...	Invoice booking	2012-07-12 13:43:35.0	8			
44516250125954512240174057...	Payment	2012-07-13 10:01:40.0	14			
44516250125954513240144057...	Create Purchase Order	2012-06-29 00:00:00.0	3		44516250125954513240144057...	
44516250125954513240144057...	Goods Receipt	2012-07-07 07:01:45.0	5			

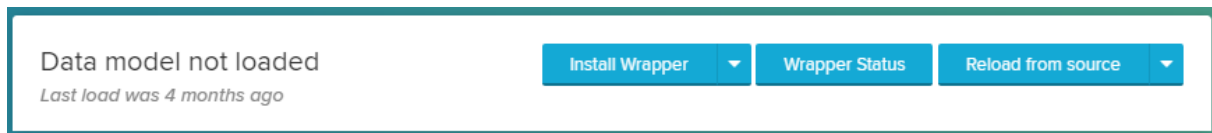
Cancel Back This is not my activity table Next

One by one select the Case ID, Activity and Eventtime column within your Activities Table. With these first three selections, you have finished obligatory configuration.

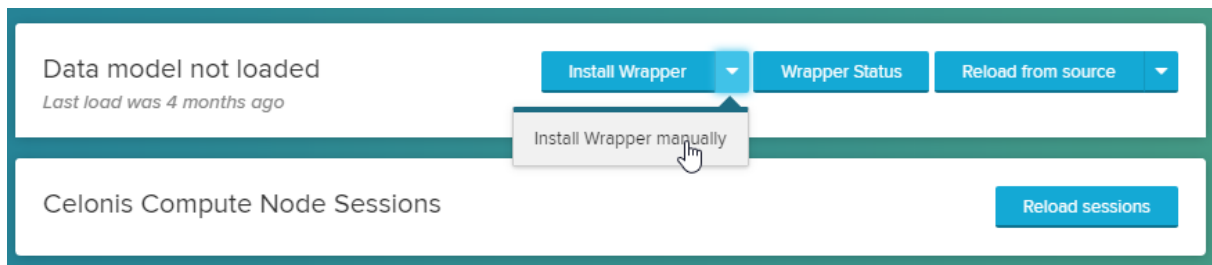
The following two steps are optional: End Timestamp and Sorting. The End Timestamp will specify the exact end time of each single event and the sorting can be used to order events that are executed exactly at the same time.

o6 – Wrapper installation

The final step to a running data model is the wrapper installation. To install the wrapper, click on 'Install Wrapper' in the status section of the data model editor:



Alternatively the wrapper can also be installed manually on the HANA. To export the required procedure click on install wrapper manually:



5.3 EVENT LOG

To import your data into SAP Process Mining by Celonis 4.2, you need to create event logs.

There are two possibilities of preparing data for process mining:

Preparation Type	Advantage	Disadvantage
1. Single event log	Fast solution by sticking to one table	Unnecessary replication of data
2. Activities table, cases table & additional information tables	Minimizing data replication and improving performance, some tables might be already at hand	Additional work with establishing foreign key relations between tables

5.3.1 SINGLE EVENTLOG

It is possible to prepare a single event log and add as many columns as you wish in order to include additional information.

However, with increasing number of columns and replicating case-specific data for each activity in the event log, performance might suffer. On the other hand, this is the easiest way of preparing data.

Minimal Eventlog

In order to set up an event log for SAP Process Mining by Celonis 4.2, you need at least the following information in **three columns**:

Case_id

The definition of a case is always process-depending. The chosen definition should suit the purpose of the analysis. Some **examples** in this context:

- In an **IT Service Desk**, the journey of a ticket can represent one case.
- In a **product assembly line**, all the steps of production for one item/product can represent

Activities

Each case of a process consists of activities that **name the steps** which happen within the process. **For instance**, some activities in an accounts payable process would be

- Scan invoice
- Book invoice
- Pay invoice

▼ Timestamps

A timestamp specifies the **exact date** (and time) when an activity was performed. Each activity in the event log must have a timestamp in order to visualize the process.

The following column is optional.

However, we strongly recommend to use a sorting column if you can, as it can be useful when dealing with large data sets.

▼ Sorting

The sorting is **an integer**. Whenever two events have the exact same timestamp, the sorting will make the activity with the **lower number to appear first in the process**. Hence, you should number the activities according to the expected procedure. A sorting is recommended, for instance, if the data only allows for timestamps that are only dates without exact time.

Additional Information

When analysing processes, topics of analysis are not restricted to the process flow itself. Therefore, additional information can be useful.

In case of a single event log, the information has to be directly attached in **additional columns**.

5.3.2 TABLES

Most often, additional information (such as materials, countries, currencies, etc.) will not differ within one case. Therefore, it is reasonable to split the event log into (at least) two tables:

An **activity table** and a **case table**.

Activity Table

The activity table usually has the **same structure as a minimal event log** (potentially including a sorting column).

Also, **activity-specific information** can be added to the activity table, such as the user which performed an activity in the IT system.

Case Table

The case table may contain **case-specific information** and will be linked to the activity table over a **foreign key relation**.

The Case ID must be a primary key of the case table (i.e. each Case ID appears only once in the case table). Hence, the information is only stored once per case.

This prevents unnecessary data explosion.

Metadata

It can make sense to extend the data model with further metadata on your processes' cases. You can simply add those additional tables and join them to the cases via a foreign key relation.

6 ADMINISTRATOR

This chapter is made for administrators of SAP Process Mining by Celonis 4.2, and explains all administrative settings in detail.

There are three types of administrators in SAP Process Mining by Celonis 4.2:

User Administrator

- The User Administrator is meant to administer [Users](#) and [Groups](#) and can furthermore apply [Authorizations](#)

Global Content Administrator

- The Global Content Administrator has access to all data models, analysis

System Administrator

- The System Administrator has access to the [System Settings](#).

Administrative Alignment:

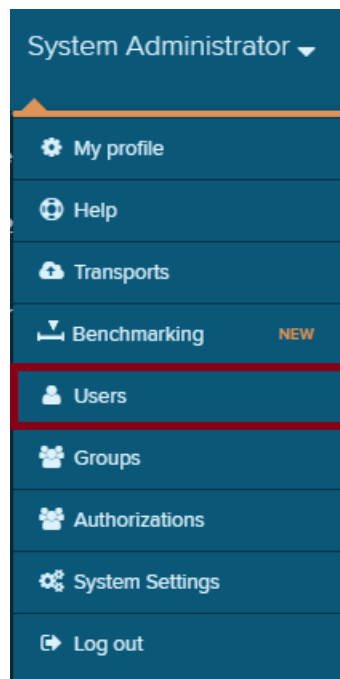
The administrative rights are split into the above mentioned categories. However, any user can be assigned up to 3 administrator roles.

6.1 USER ADMINISTRATOR

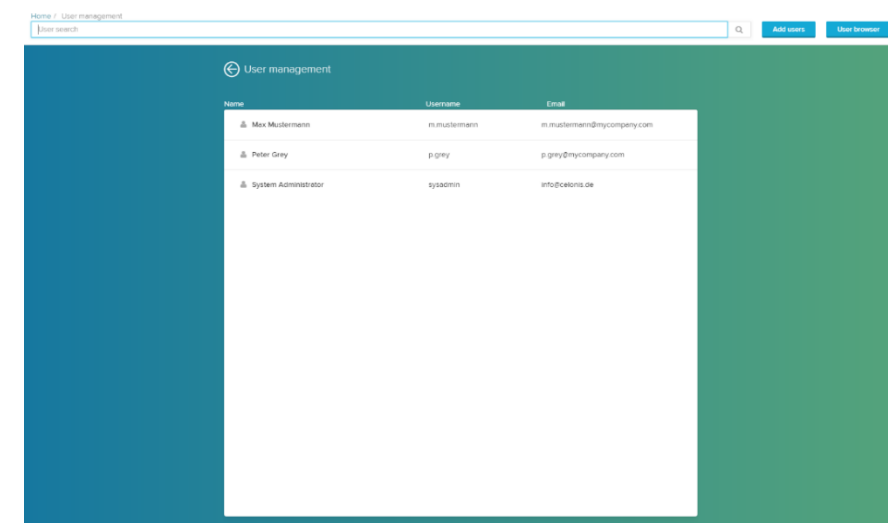
The User Administrator has access to the [users](#), [groups](#) and [authorizations](#) objects. Users can be assigned various rights towards different objects. To facilitate this process for installations with a large amount of users, Groups have been introduced to order customers and facilitate the permission changing process. Each group can contain an unlimited number of users.

6.1.1 MANAGE USERS

To access the user menu, choose **Users** in the Main Menu:



This will open the user overview.



In the centre of your screen, you will find a list of all registered users.

To **search for users**, you can use the search field at the top:



User browser

The user browser is an alternative view on users, and includes an overview of administrative roles.


Search: <input type="text"/>									
Username	Profile	First Name	Last Name	E-Mail	Locked?	System Admin	User Admin	Content Admin	
m.mustermann	Open Profile	Max	Mustermann	m.mustermann@mycompany.com	false	false	false	false	
p.grey	Open Profile	Peter	Grey	p.grey@mycompany.com	false	false	false	false	
sysadmin	Open Profile	System	Administrator	info@celonis.de	false	true	true	true	

Showing 1 to 3 of 3 entries

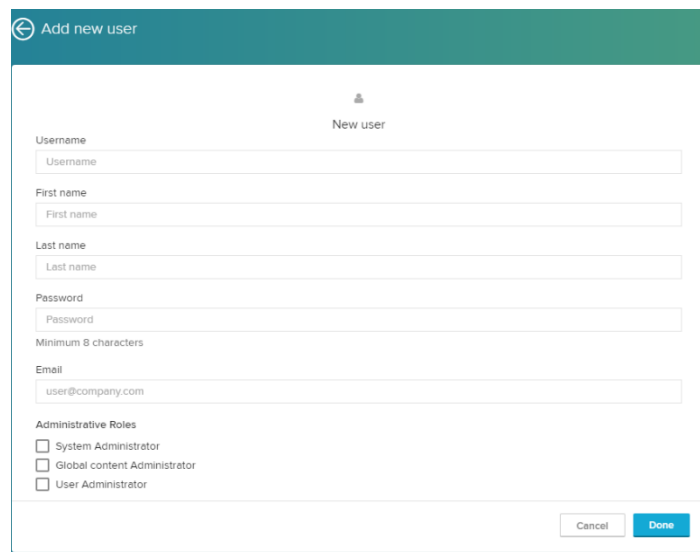
Previous 1 Next

To open the user browser, use the  button in the user overview.

Add Users

Click on the  button in the user overview to add a new user.

This will create a blank **user profile**, ready to be filled with a new SAP Process Mining by Celonis 4.2 user!



The screenshot shows a web form titled "Add new user". At the top, there is a back arrow icon and the title "Add new user". Below this, there is a user icon and the text "New user". The form contains the following fields and sections:

- Username:** A text input field with the placeholder "Username".
- First name:** A text input field with the placeholder "First name".
- Last name:** A text input field with the placeholder "Last name".
- Password:** A text input field with the placeholder "Password". Below this field, it says "Minimum 8 characters".
- Email:** A text input field with the placeholder "user@company.com".
- Administrative Roles:** A section with three checkboxes:
 - ☐ System Administrator
 - ☐ Global content Administrator
 - ☐ User Administrator

At the bottom right of the form, there are two buttons: "Cancel" and "Done".

Please provide a **Username** (which will be used to login into SAP Process Mining by Celonis 4.2), a **First Name**, a **Last Name**, a **Password** and an **E-Mail Address**.

Password:

The new user will be asked to change its password after the first login. The password specifications can be edited following our *Operation Guide* (see [the installation page](#) for further information and download resources).

Username:

Please note, that you cannot change the username after the user has been created. Usernames furthermore have to be unique.

You can furthermore assign administrative roles to the new user (see the above [Administrator page](#) for further information on administrative roles).

Edit Existing Users

Click on any user in the user overview (or use the [Open Profile](#) link in the user browser) to re-open the user's profile.

You can edit all fields (except for the Username), assign new administrative roles or **lock the account**.

Account

☐ Lock account


If an account is locked, the user can't login into the system until the lock has been removed by a user administrator. However, he keeps all authorizations for any object that he has acquired in the past.

Furthermore, you can manage the user's authorizations with the "Manage Authorizations" link.

Manage authorizations

To get more information on authorizations, please conduct the [Authorizations](#) section.

Delete A User

To delete an existing user, open the profile (as it has been described above), and choose  at the bottom of the page.

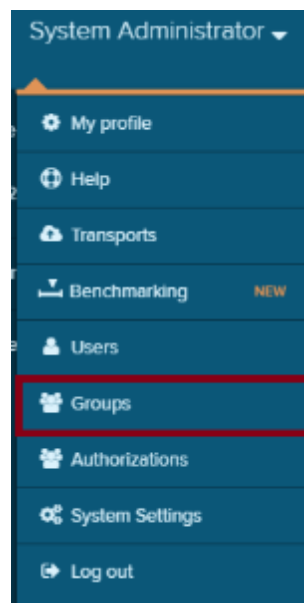
Please Note

The user will be removed permanently, this action can't be undone!

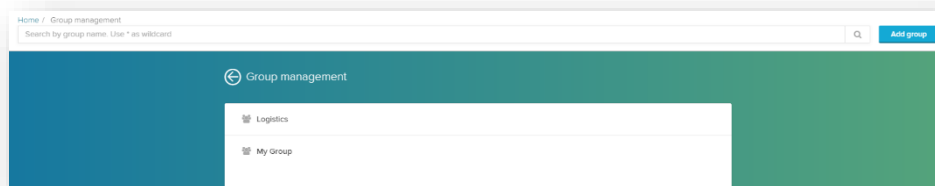
6.1.2 MANAGE GROUPS

Groups can be edited in a similar way, as users can be edited.

You can open the group section with the main menu:



You will be directed to the **Group management**. This view shows all existing groups.



You can add an unlimited number of groups. Each group can carry further *subgroups*, which facilitates the authorization inheritance. Authorizations, that are applied to a group, will be applied to all subgroups as well.

Add a new group

Click on **Add group** to add a new group.

This will open the **group editor**:




Insert a name for your group. Please pay attention: group names have to be unique.

To add users (or subgroups) to your group, use the **Add users** button, which will extend the window.

The following three tabs are now visible:

Members

Click on **Add members +** to add users to your group.

Search by name, username or email. Use * as wildcard		Q	Done
 Max Mustermann	m.mustermann		
 Peter Grey	p.grey		Add
 System Administrator	sysadmin		

Hover any user, and a **Add** button will appear. Click on *Add* to add this user to your group.

Search Users

You can make use of the search field to search for users.

Search by name, username or email. Use * as wildcard		Q
--	--	---

Don't forget to save your changes with **Done**.

Groups

Click on **Add Groups +** to add subgroups to your group.

Groups		Search by group name. Use * as wildcard.		Q	Done
	Logistics				

Hover any group, and a **Add** button will appear. Click on *Add* to make this group a subgroup of this group.

A group can be a subgroup of more than one groups.

Search Groups

You can make use of the search field to search for groups.

Search by group name. Use * as wildcard.



Done

Don't forget to save your changes with .

▼ Group Membership

This section shows a list of all superior groups, that have listed this group as a subgroup.

6.1.3 MANAGE AUTHORIZATIONS

Authorization objects are a handy way to **manage access to data** within an analysis project. In this section, you will learn about authorization objects and how to use them.

Authorization objects are typically used to restrict access for users/groups to the data necessary for their field of work. This can be for example regional (by market, country, and continent), division (company code) or client based.

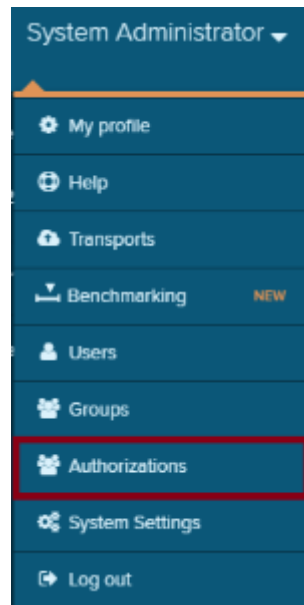
Permissions

If you want to restrict access to a whole document, a data model or a project, please refer to the [Permissions](#). To be able to use Authorization Objects they have to be linked to a user and to a data model.

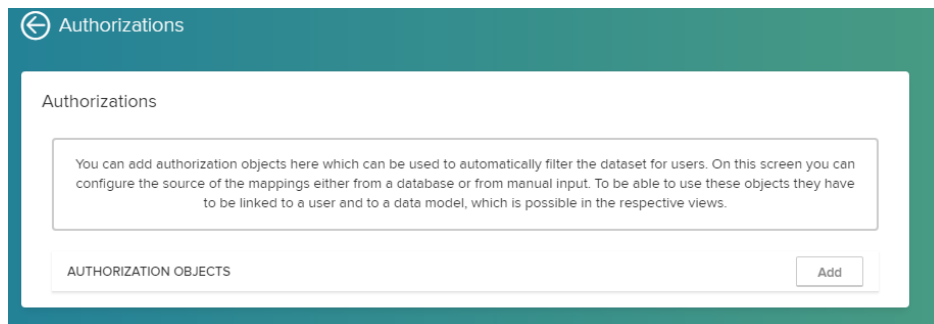
6.1.3.1 Add Authorization Objects

To enable authorizations, you first have to **add authorization objects** to SAP Process Mining by Celonis 4.2.

Therefore, navigate to the [Homescreen](#) and choose *Authorizations* from the main menu.



The **Authorization overview** will show up:



First, you should specify a meaningful **name** for the object. Then you can decide whether the values for your mapping should be **queried from a database** or **entered manually**.

Values Queried from a database


Pre-configure your connection and queries in a configuration file on the application server.

Please refer to the [Operation Guide](#) if you need help.

Values entered manually

Choose this option if you want to add the allowed values manually.

However, please be aware that the values have to be adapted every time they change, as they are not queried from any external data source.

 Authorizations

Authorizations

You can add authorization objects here which can be used to automatically filter the dataset for users. On this screen you can configure the source of the mappings either from a database or from manual input. To be able to use these objects they have to be linked to a user and to a data model, which is possible in the respective views.

AUTHORIZATION OBJECTS

Add

CONFIGURATION

Name

New Object

Value mapping

Values are entered manually below ▼

Source for possible values

▼

Allowed values - if left empty values can be entered freely for each user

Delete

Save

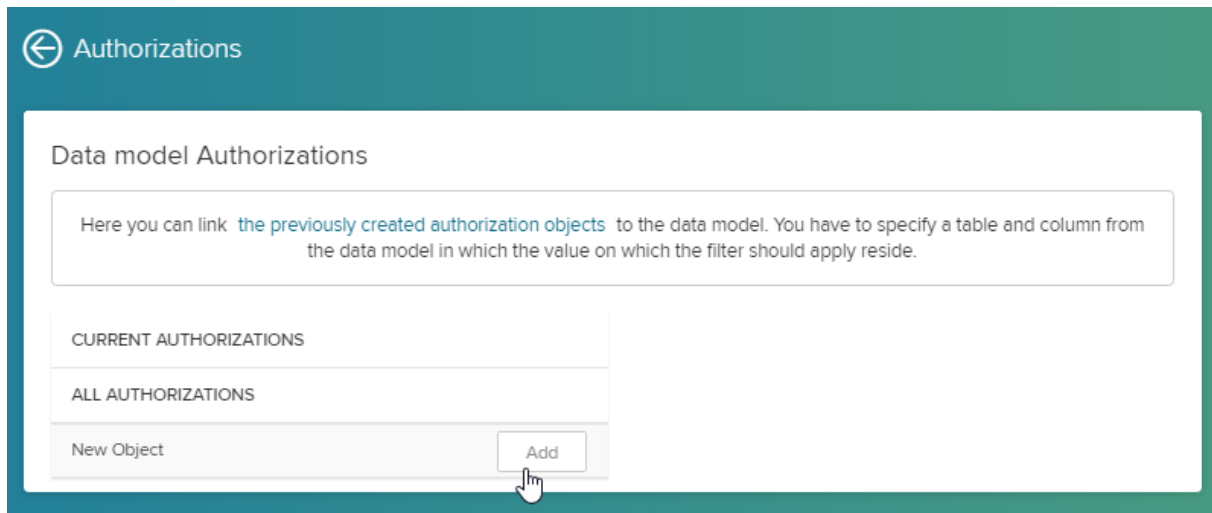
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SAP Process Mining by Celonis 4.2 – Manual

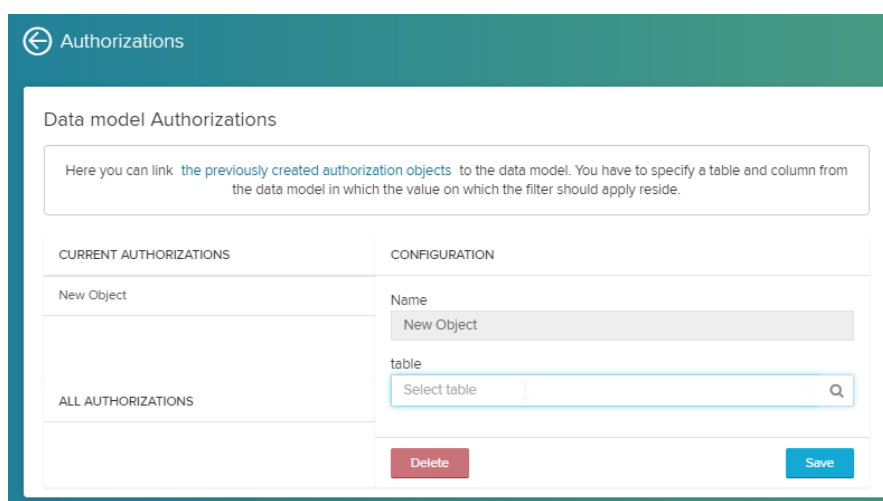
305

6.1.3.2 Application To Data Models

After you have added all required authorization objects, you have to apply them to the dedicated data models. To do so, open the [authorizations](#) tab in your [data model](#). You should see all added Authorization Objects in the bottom left box. To deploy an authorization object to the data model, simply hover over it and click on the emerging *add* button.



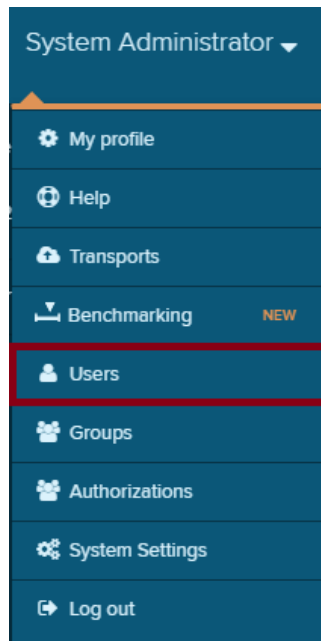
A configuration template will open. Choose the associated table and column for the authorization object and confirm your input with *save*.



6.1.3.3 Application To Users

In this step, you have to apply the authorizations to the respective users/groups

Open the **Users** tab on your Homescreen and select an affected user:



Choose *Users* to access the user overview.

A screenshot of the 'Edit user: System Administrator' form. The form is titled 'Edit user: System Administrator' and shows the user 'System Administrator'. It includes fields for Username (sysadmin), First name (System), Last name (Administrator), Password (at least 8 characters), Confirm new password, and Email (info@celonis.com). There are also checkboxes for Administrative Roles (System Administrator, Global content Administrator, User Administrator) and Account settings (Lock account, Created by: Celonis Internal User Directory). A 'Manage authorizations' link is visible. At the bottom, there are buttons for 'User overview', 'Cancel', and 'Done'.

Click on the here - or on the authorization link on the bottom of the form to get to the authorizations view:

Authorizations

You can link authorization objects to the user here. If a authorization object has a database connection as source you can synchronize the values here. Otherwise you can enter the values manually.

CURRENT AUTHORIZATIONS	CONFIGURATION
ALL AUTHORIZATIONS	Delete
New Object	Save

Add

Now you can choose the authorization objects that should be applied and add the according values.

Once you have done this, the user can only view the part of the data you have authorized.

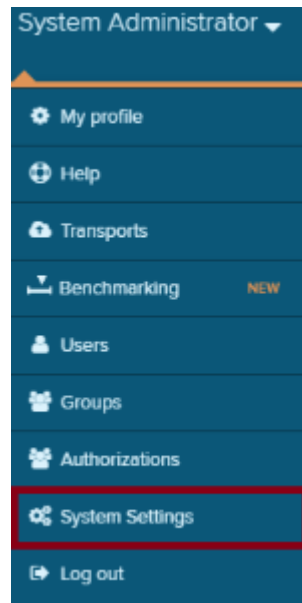
6.2 GLOBAL CONTENT ADMINISTRATOR

The Global Content Administrator has access to all projects with all included data models and analysis documents. Global Content Administrators can furthermore access the Analysis Settings and the Data Model Editor. However, he is not allowed to apply authorizations himself (User Administrator rights are required).

6.3 SYSTEM ADMINISTRATOR

The System Administrator has access to **System Settings**.

Open these in the main menu.



The following categories are available:



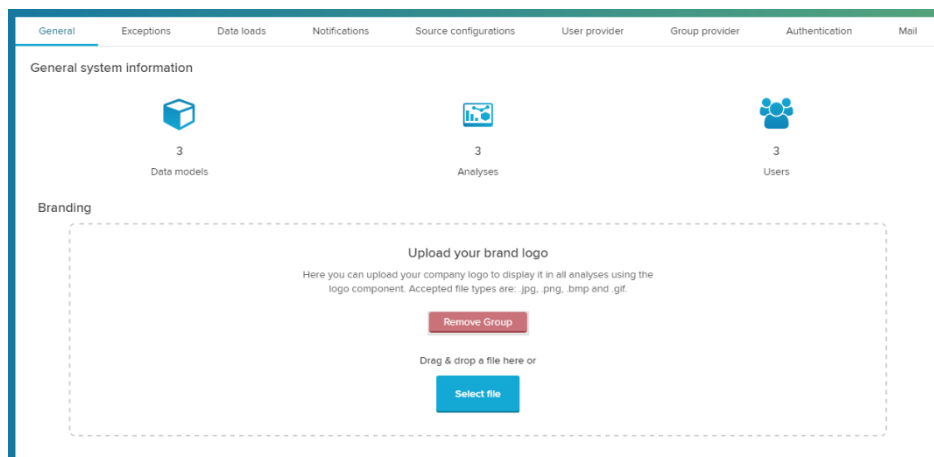
Each of them will be displayed on the subpages.

- [General](#)
- [Exceptions](#)
- [Data Loads](#)
- [Notifications](#)
- [Source Configuration](#)
- [User-/Group Provider](#)
- [Authentication](#)
- [Mail](#)

6.3.1 GENERAL

The **general system settings** offer an overview of your SAP Process Mining by Celonis 4.2 installation in the **general system information**.

Furthermore, you can upload a brand logo.



General system information

In this section, you are provided with the number of existing data models, analyses and users.

Branding

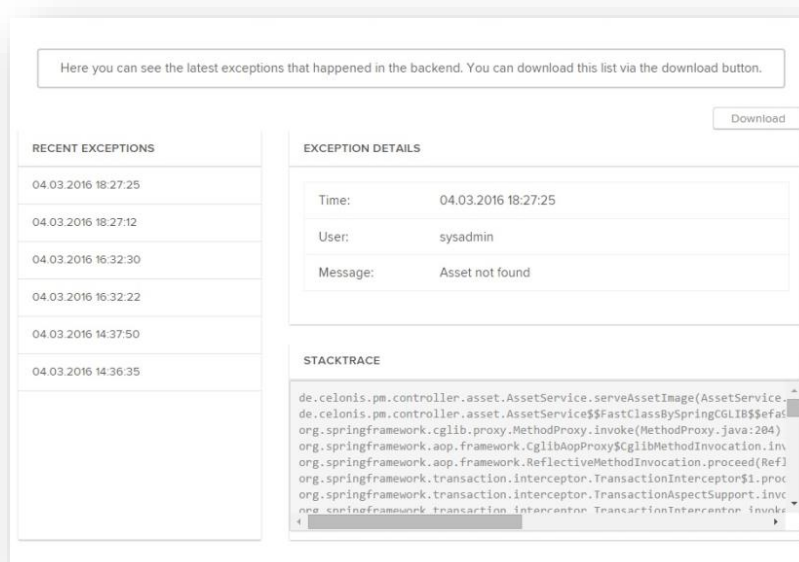
You can customize your analysis with your custom brand logo, which is meant to be uploaded in this section. To place your logo in an analysis, make use of the [Logo](#) component.

6.3.2 EXCEPTIONS

In the exceptions tap, you can view all exceptions that occurred in the backend in the past.

You can view up to 50 exceptions and they are stored for 14 days. This helps the administrator to analyse irregularities and perform user troubleshooting. The exception details give a quick overview of the time, user and exception message, e.g. "Passwords do not match". You can also download the summary as .txt-file for further analyses e.g. for attaching it to a bug report.









Here is an example of the exception view:



6.3.3 DATA LOADS

The Data Load section of the System Settings deal with data loads of data models.

For more information about the data loading process, consult [this chapter](#).

General	Exceptions	Data loads	Notifications	Source configurations	User provider	Group provider	Authentication	Mail
Active loads	Loaded data models			Scheduled loads		Load history	Failed loads	
LOAD HISTORY <input type="text" value="Search by data models name"/>								
<input type="button" value="Q"/>								
	Data model Purchase to Pay - Demo - Small Last loaded on: 24.11.2016 11:10						Located in: Project P2P_Demo	
	Data model Purchase to Pay - Demo - Small Last loaded on: 17.11.2016 16:00						Located in: Project P2P_Demo	
	Data model Purchase to Pay - Demo - Small Last loaded on: 17.11.2016 15:00						Located in: Project P2P_Demo	
	Data model Purchase to Pay - Demo - Small Last loaded on: 17.11.2016 14:01						Located in: Project P2P_Demo	
	Data model Purchase to Pay - Demo - Small Last loaded on: 17.11.2016 14:00						Located in: Project P2P_Demo	
	Data model Purchase to Pay - Demo - Small Last loaded on: 17.11.2016 13:07						Located in: Project P2P_Demo	
	Data model Purchase to Pay - Demo - Small Last loaded on: 17.11.2016 13:06						Located in: Project P2P_Demo	
	Data model Purchase to Pay - Demo - Small Last loaded on: 16.11.2016 16:01						Located in: Project P2P_Demo	
	Data model Purchase to Pay - Demo - Small Last loaded on: 16.11.2016 16:00						Located in: Project P2P_Demo	

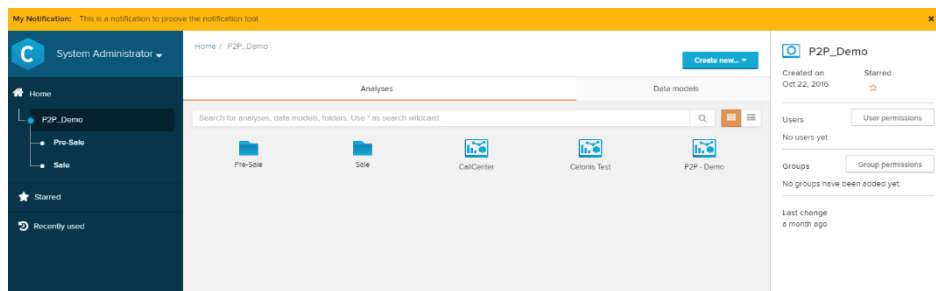
Through the different tabs, you can display **active loads**, **loaded data models**, **scheduled loads**, **failed loads**, and (as displayed in the screenshot above) the **load history**.


Active loads	Loaded data models	Scheduled loads	Load history	Failed loads
--------------	--------------------	-----------------	--------------	--------------

Click on any of the loads to open the [Graphic Editor](#) of your data model.

6.3.4 NOTIFICATIONS

Notifications will, if activated, always be displayed for all users at the top of the SAP Process Mining by Celonis 4.2 window. This is a great tool to publish announcements!



Every user can however remove the notification with the small  in the upper right corner.

To add a new notification, click on

New notification

Enter a title and a notification message. Don't forget to activate your notification with the checkbox:

☒ **Enable notification**

To schedule the notification, you are asked to provide a starting and an ending timestamp:

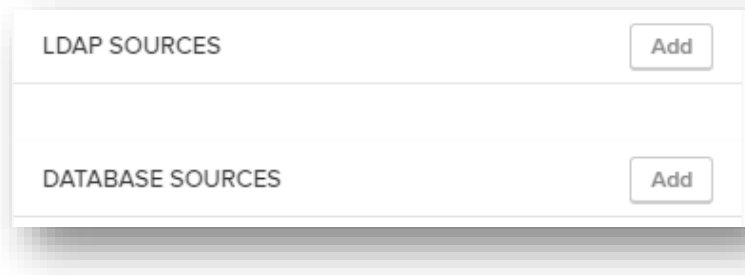
Save your settings with

Done


6.3.5 SOURCE CONFIGURATION

Here you can specify the source systems for the authentication system and the user / group providers.

You can configure **LDAP systems** and **database systems** on the left by clicking on the



To implement a source, you need to select a name, URL, username, password and search base/ driver class name:

Don't forget to save your settings with  .

6.3.6 USER-/GROUP PROVIDER

In these two tabs you can configure the user-/group providers if you want to use user-/group synchronization with other systems.

You can [again](#) choose between a **database table** and a **LDAP system** as source for the synchronisation process.

For both servers, you need to provide several columns, containing required user information:

PROVIDER CONFIGURATION

Buttons: Delete, Test, Save

Name: New DATABASE Provider

User retrieval query: e.g. select * from USER_TABLE

Username column

Language column

First name column

Last name column

Email column

Currency column

Seconds delay


☐ Active

Database source: Select database source

Testing:

You can test your database/LDAP connection before activating it.


Fill out all fields and click on the  button in the upper right corner.

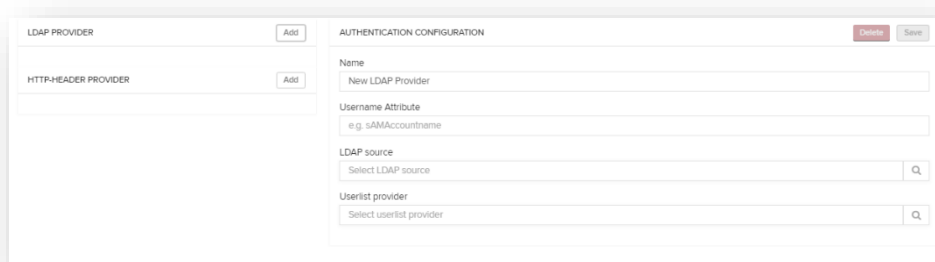
Don't forget to save your settings with  .

6.3.7 AUTHENTICATION


Here you can specify the user authentication.

Supported methods are LDAP and HTTP-Header. To use them, you have to configure [user providers](#) and - if you want to use LDAP - a [LDAP source](#).

Again, choose your desired provider on the left, click on  and fill out the displayed form.



The screenshot shows a web interface for configuring authentication. On the left, there is a list of providers: 'LDAP PROVIDER' and 'HTTP-HEADER PROVIDER', each with an 'Add' button. On the right, the 'AUTHENTICATION CONFIGURATION' form is shown with fields for Name, Username Attribute, LDAP source, and Userlist provider, each with a search icon.

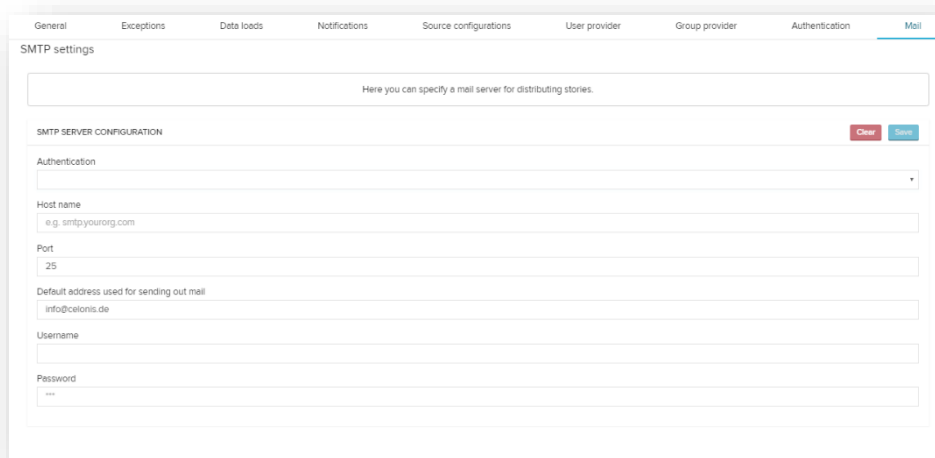
Don't forget to save your configuration, use the .

6.3.8 E-MAIL

To distribute [Stories](#) via e-mail on a periodical basis, you need to provide information on your SMTP server in this section.

Please fill out your Authentication, Host name, default sender address, username and password.

If necessary, adjust the port.



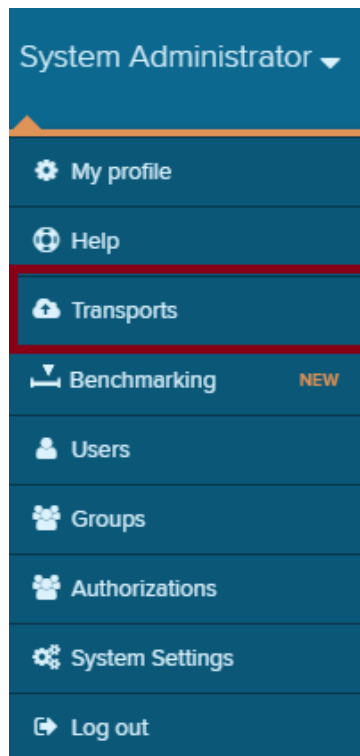
The screenshot shows the 'Mail' tab in the Celonis configuration interface. At the top, there is a navigation bar with tabs: General, Exceptions, Data loads, Notifications, Source configurations, User provider, Group provider, Authentication, and Mail. Below the navigation bar, the 'SMTP settings' section is displayed. It includes a text box with the instruction: 'Here you can specify a mail server for distributing stories.' Below this, there is a section titled 'SMTP SERVER CONFIGURATION' with a 'Clear' button and a 'Save' button. The configuration fields are: 'Authentication' (a dropdown menu), 'Host name' (a text box with the example 'e.g. smtp.yourorg.com'), 'Port' (a text box with the value '25'), 'Default address used for sending out mail' (a text box with the example 'info@celonis.de'), 'Username' (a text box), and 'Password' (a text box with a masked input field).

6.4 MANAGE TRANSPORTS

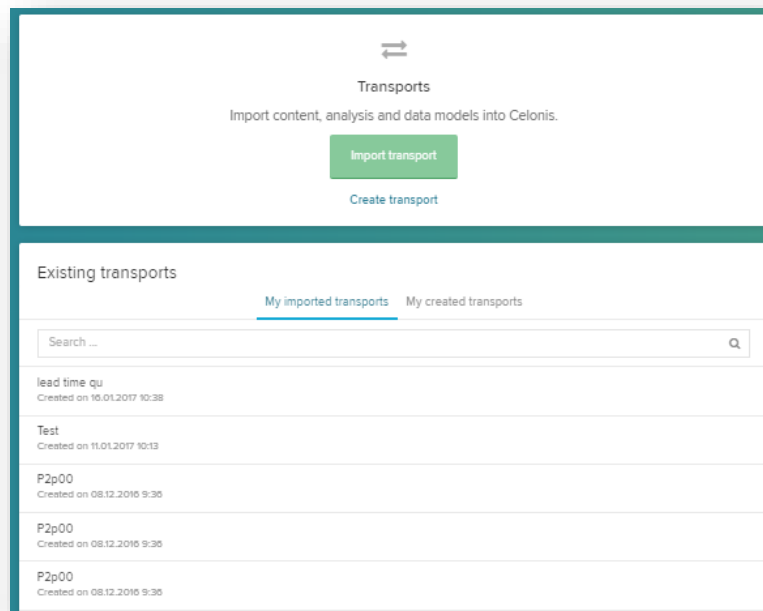
Transports provide the possibility to easily **transfer content** between different instances. In this chapter, you will learn how to create transports from your SAP Process Mining by Celonis 4.2 documents.

6.4.1 CREATE TRANSPORT

Enter the Transports UI with the main menu:



In the transport UI you can find a list of previously exported and imported transports:



Transports
Import content, analysis and data models into Celonis.

[Import transport](#)
[Create transport](#)

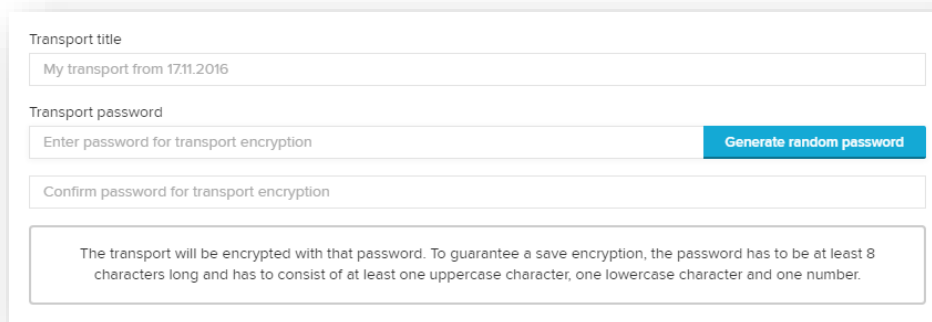
Existing transports

[My imported transports](#) [My created transports](#)

Search ...

lead time qu	Created on 10.01.2017 10:38
Test	Created on 11.01.2017 10:13
P2p00	Created on 08.12.2016 9:30
P2p00	Created on 08.12.2016 9:30
P2p00	Created on 08.12.2016 9:30

In the next step you have to specify the title of your transport and a password, which will guarantee a save encryption.



Transport title

My transport from 17.11.2016

Transport password

Enter password for transport encryption [Generate random password](#)

Confirm password for transport encryption

The transport will be encrypted with that password. To guarantee a save encryption, the password has to be at least 8 characters long and has to consist of at least one uppercase character, one lowercase character and one number.

You can also automatically generate a strong password.

Password:

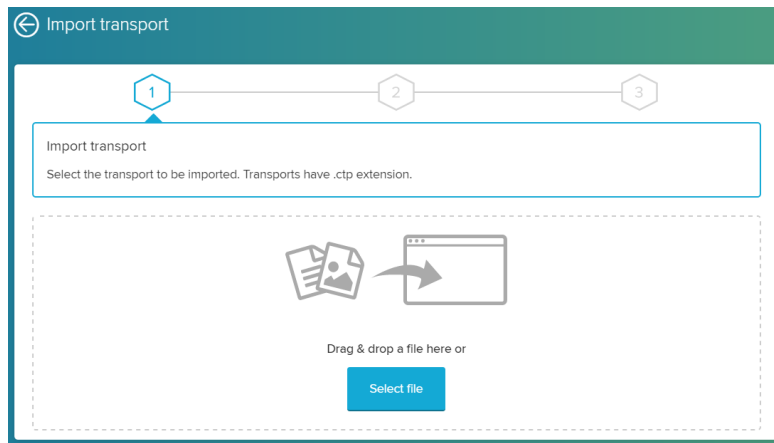
The password has to be at least eight characters long and has to consist of at least one uppercase character, one lowercase character and one number to guarantee a save encryption.

6.4.2 IMPORT TRANSPORT

Import transport

To start the import of a transport, click on

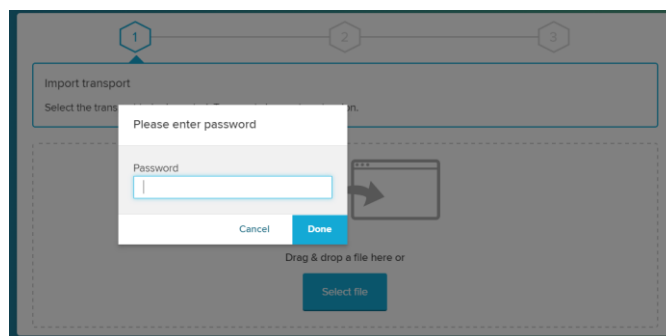
Drag and drop a transport-file to the canvas



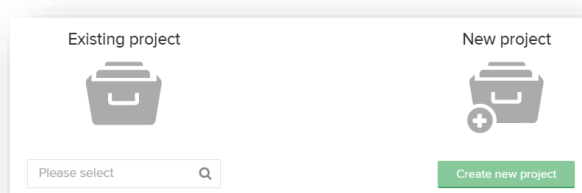
Select file

or select it from your system by clicking :

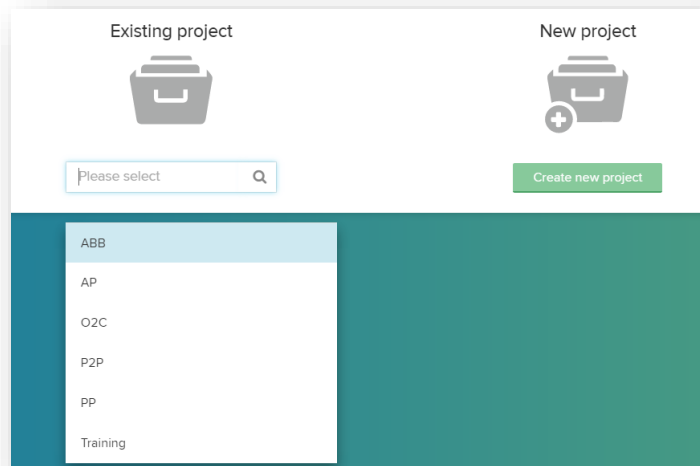
Before uploading, you have to type in the password.



When the transport was uploaded, you can decide to install it into an existing project or to create a new one.



If you chose to import an analysis without a data model, you can assign an existing data model from the existing projects. You have to import the transport to an existing project to be able to do that. Select the respective data model in the dropdown next to the analysis:



No Data Model:

If you import an analysis without a data model and you don't assign one either, you have to choose the data model when you first open the analysis.

7 PROACTIVE INSIGHTS

celonis



CELONIS PROACTIVE INSIGHTS



celonis

A SMART ENGINE THAT AUTOMATICALLY
DISCOVERS THE PROBLEMS IN YOUR PROCESSES
AND FINDS OUT WHAT
YOU NEED TO CHANGE

A SMART ENGINE THAT GIVES
YOU RECOMMENDATIONS

A SMART ENGINE THAT
PROACTIVELY NOTIFIES YOU
ABOUT PROBLEMS IN YOUR
PROCESS





CONFORMANCE

SOCIAL

MACHINE LEARNING

COMPANION

7.1 PI CONFORMANCE



Conformance

With PI Conformance, it is possible to compare your plans to reality. You can check if your planned processes in BPMN models are matching the reality and how your organization is performing your processes. PI Conformance automatically goes through each single case in the process and extracts all violations to your desired process. Not only the problems and their effect on your major process KPIs are directly obvious, PI Conformance also includes a powerful root cause analysis which immediately tells you where your problems actually derive from.



Use cases



Create a target process



Check your conformance

7.1.1 PI CONFORMANCE USECASE



PI Conformance

Next Level Process Mining

Proactive Insights brings Process Mining to the next level. Next level Process Mining algorithms by allow target process comparison and detailed root cause analyses to any process deviations within event data. PI presents process violations and their root causes in an actionable and ready to tackle violations feed.

Process Mining is generally divided into two major sub-categories – Process Discovery and Conformance Checking. Process Discovery is the core functionality within Process Mining allowing the users to understand how their processes run in reality. With PI Conformance we are taking Process Mining to the next level. A fully integrated and automated target process comparison.

From exploration to proactive analytics

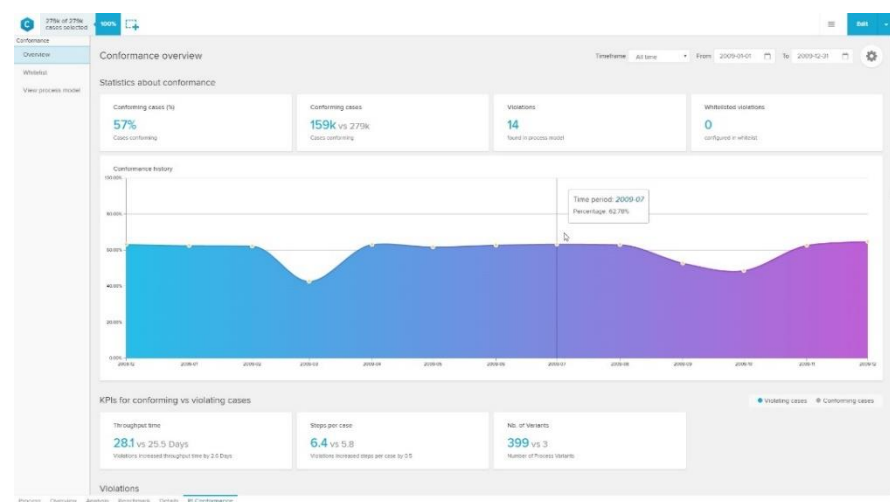
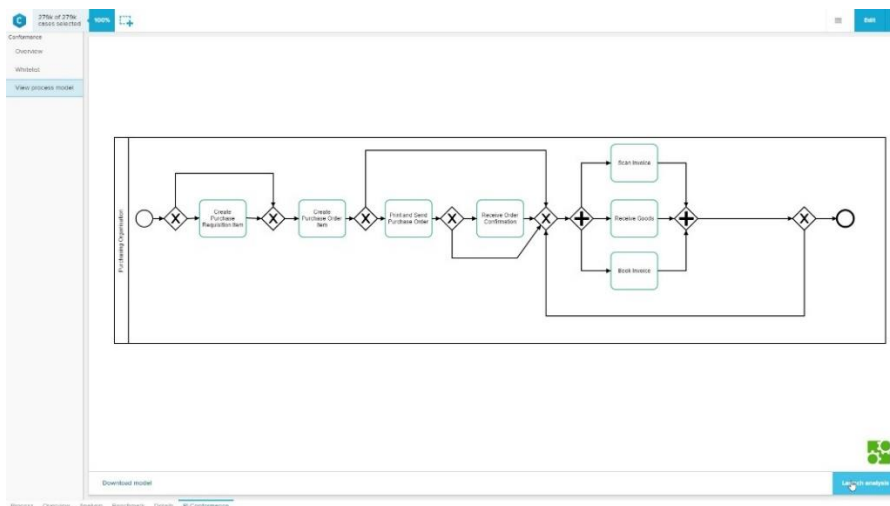
Process Discovery is the perfect tool to provide 100 % transparency. Offering a powerful graph by which it is easily possible to explore all process variants within a company. PI Conformance does not require the user to search for himself anymore. Process deviations and problems within a process are extracted completely automatically. Proactive insights on all process deviations are generated within seconds and can be tackled right away.

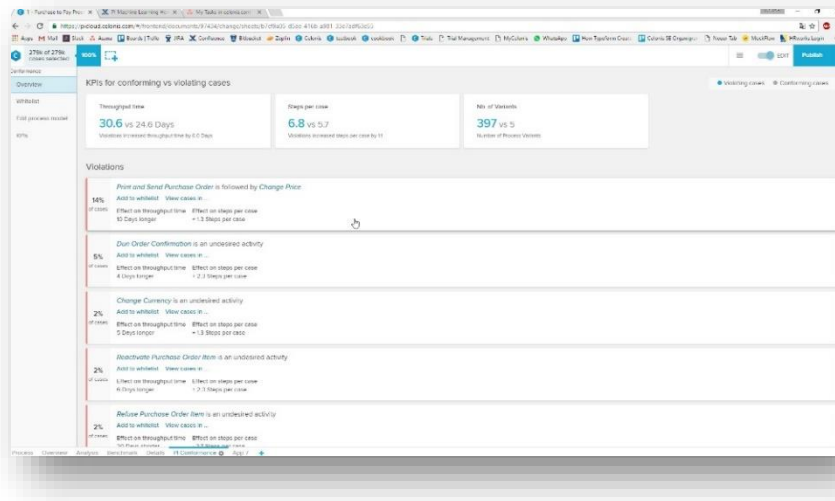
Go through your To-Do-List instead of doing image comparisons

Traditional research tends to display process deviations within a process graph. Highlighting non-conformant flows by coloring or different shapes of the symbols. The end result might look impressive at first glance. But will let you be the one who has to search for the single insights once again. PI Conformance will not leave you unguided at this point. Instead all problems within your process are presented in a violations-feed. Just like a prioritized to-do-list, the violations-feed will allow you to tackle all problems one by one. Instead of searching for the most important and most critical violations you have them right at your fingertips.

Avoid problems in the future

Obviously, it is extremely powerful to find out what is going wrong in your organization. But the real value lies in avoiding these problems in the future. PI will assist you in this by providing proactive advice on each single violation. The integrated root cause analysis will extract the highest correlating properties shared by all the violating cases automatically. The root cause analysis enables you to take a look at millions of information points and check if they can be linked to a problem within seconds. So if you decided to tackle a problem the violations feed highlighted for you. The Root Cause Analysis is the second level of PI Conformance's proactive insights. It points where in your company you specifically have to improve.





7.1.2 PI CONFORMANCE OVERVIEW

The overview section provides the most important information about your process conformance at a first glance!

Overview

The Overview is split in three main sections. General KPIs and a timetrend, the effect of violations on KPIs and the violation feed. The first section includes 4 KPIs and a chart, that displays the relative amount of conformance over a past time period.

▼ Conformance in Percentage

This KPI is based on the amount of cases, that match your Process Model.

This value is furthermore the basis for the Conformance history chart.

▼ Conformance in absolute numbers

This KPI returns the above-mentioned Conformance KPI in absolute numbers.

▼ Violations

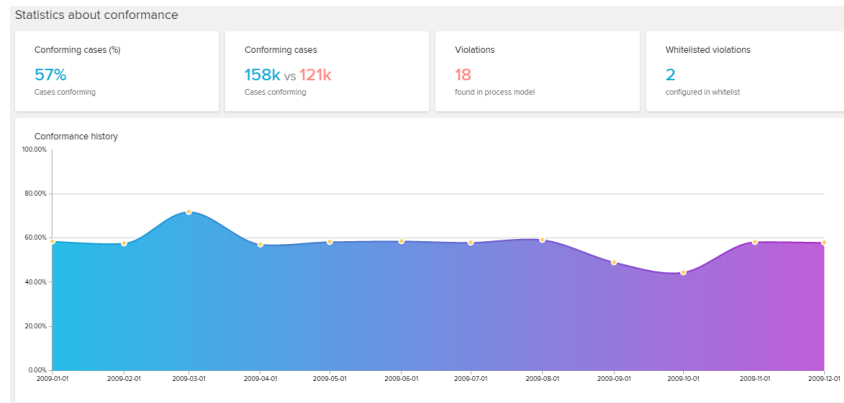
Violations are derivations from your process model. All violations are listed in the Violations section on this overview page.

▼ Whitelist Violations

Whitelist Violations are violations, that are ignored in the conformance calculations. They won't appear in your violations feed.

Conformance history

The conformance history is a chart that displays the course of the relative conformance.



Effects on KPIs

All KPIs in this section are comparisons of cases, that conform to your [Process Model](#) with those, that do not conform. KPIs for the conforming cases are colored blue, for non-conforming cases are colored red.



By default, there are two KPIs visible Throughput Time and Steps per case.

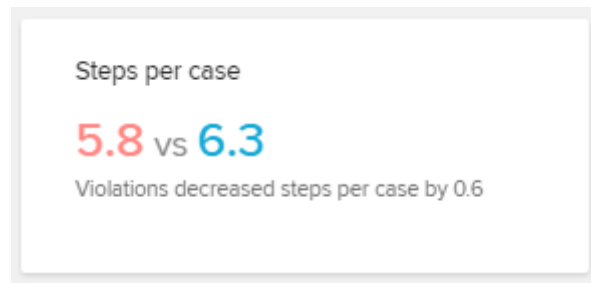
▼ Throughput Time

This KPI compares the throughput time:



Steps per case

This KPI compares the events per case between violating and conforming cases in the eventlog:



Further [KPIs](#) can be added in the KPIs section.

Violations

This section lists all violations, sorted to their affection on cases.

Violations		
14% of cases	<i>Create Purchase Order Item</i> executed as <i>START</i> activity Add to whitelist View cases in ... Effect on throughput time: 3 Days shorter Effect on steps per case: - 1.3 Steps per case	
7% of cases	<i>Scan Invoice</i> executed as <i>START</i> activity Add to whitelist View cases in ... Effect on throughput time: 4 Days shorter Effect on steps per case: - 1.3 Steps per case	
7% of cases	<i>Scan Invoice</i> is followed by <i>Create Purchase Order Item</i> Add to whitelist View cases in ... Effect on throughput time: 4 Days shorter Effect on steps per case: - 1.3 Steps per case	

Let's have a closer look on this view:

14% of cases	<i>Change Price</i> is an undesired activity Add to whitelist View cases in ... Effect on throughput time: 8 Days longer Effect on steps per case: + 0.9 Steps per case	
-----------------	--	--

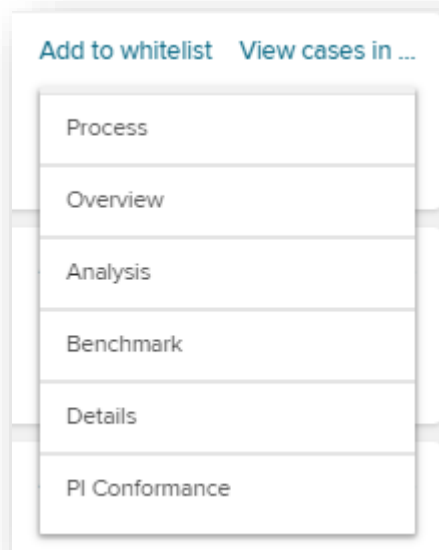
Each valuation starts with listing the actual violation (for example: "Change Price is an undesired activity").

Furthermore, the effects on your KPIs (see above) are displayed, with the direct derivation which is caused by this violation.

Each case offers two options: [Add to whitelist](#) [View cases in ...](#)

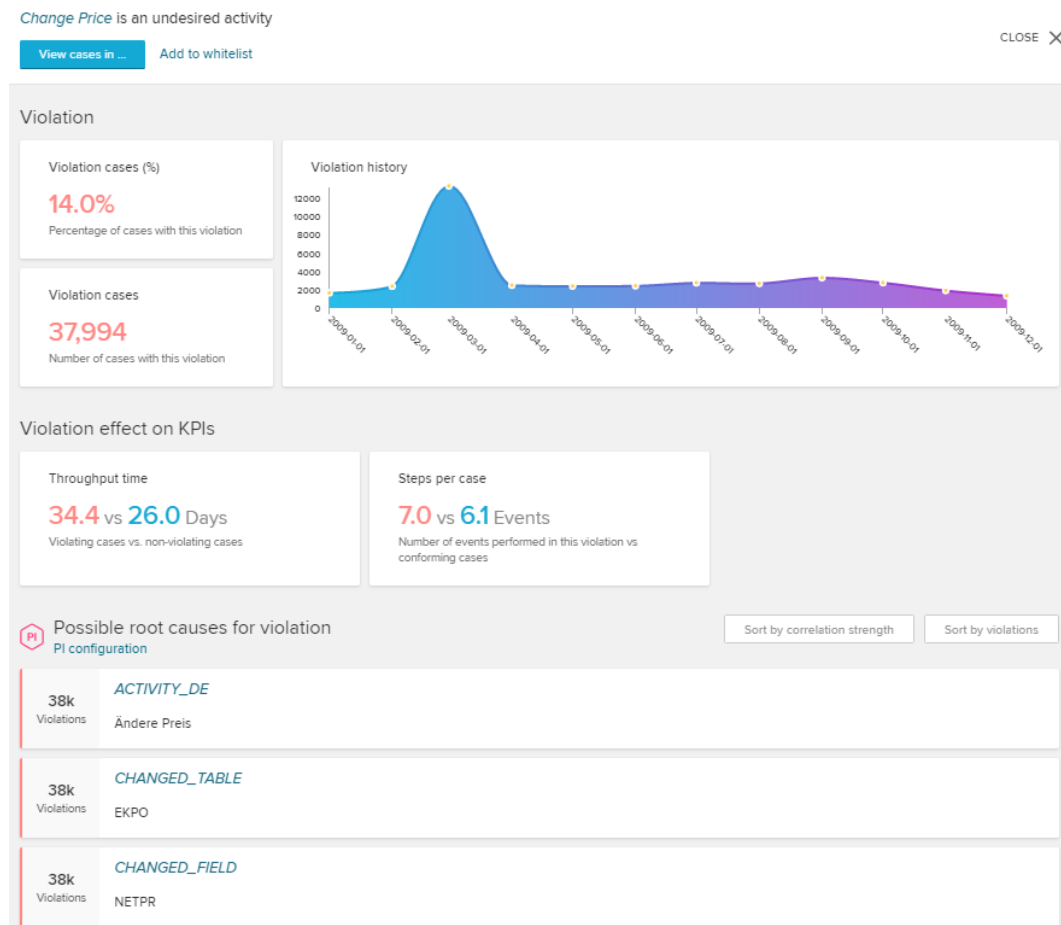
You can either add this violation to your [Whitelist](#) or further examine your case with the "View cases in..." link.

This will open the following drop-down menu, which lists all sheets that are included in this analysis document.



Therefore, a [Selection](#) is created, that includes all cases of this violation.

For **further examination** of your violation, just click on the valuation to open a detailed view on your violation:



Violation

The top part shows general statistics on the selected violation. In what ratio and number of cases are showing this violation and how are they distributed over time.

Violations effect on KPIs

Second, the effect of this single violation on the main KPIs is shown. The same way it is shown in the Overview, the violating versus non-violating cases are compared for this single violation only.

Possible root causes for violations

In the feed at the bottom of the violation details possible root causes for this process violation are detected. The whole dataset is scanned for attributes that show a high correlation to the violation and a high number of violations. With this significant drivers for the single violations are extracted and can be sorted in the presented feed.

The correlation value is showing the relative number of cases that are violating against the cases that are not violating for the single attribute.

Opening one entry in the feed allow to view and select the cases with the feature and with the violation in another analysis sheet for further analyses:

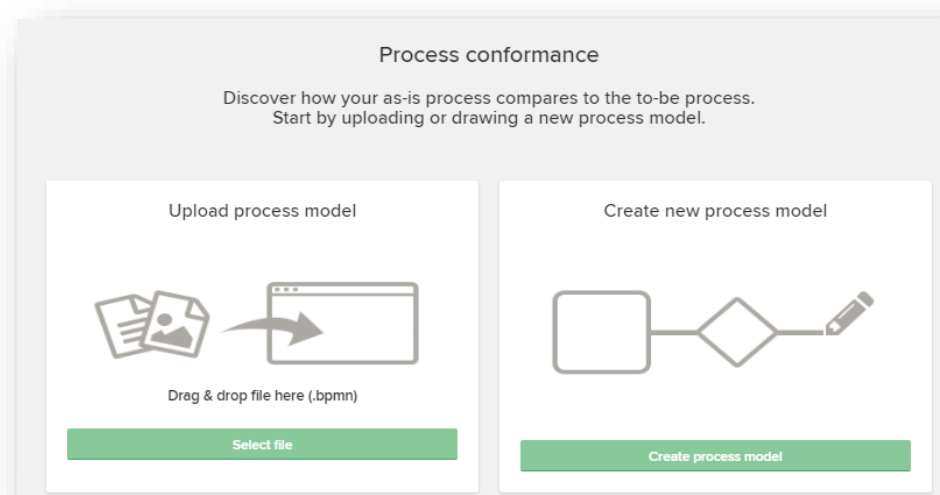
8k Violations	<i>Material Group</i>
	003, 008
Material Group: 003 8421 Violating cases, correlation: 2.860 View cases in ...	
Material Group: 008 3233 Violating cases, correlation: 2.536 View cases in ...	

7.1.3 PROCESS MODELING

Create a target process

PI Conformance allows you to either upload an existing BPMN model or to create a new target model in the build in process modeller.

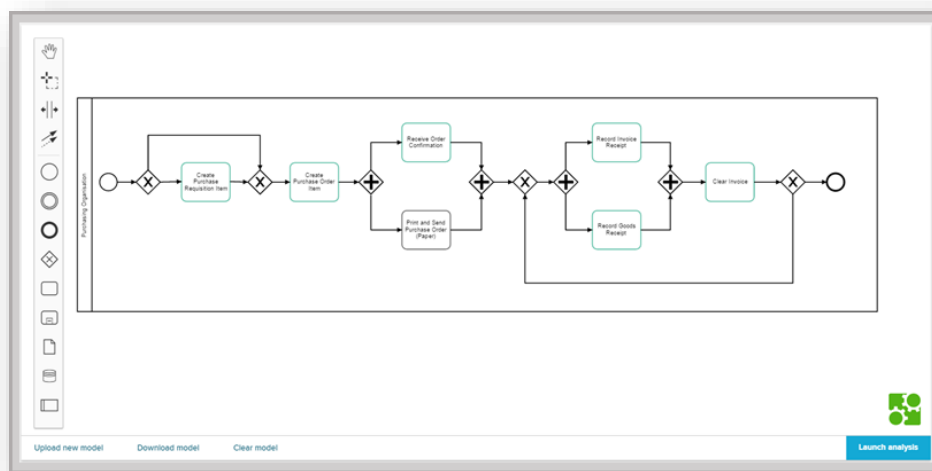
In both cases the [Business Process Model and Notation](#) is used.



Create a new target process from scratch

This screen lets you edit (or create) a process model.

As already mentioned, your process will be compared to this process to analyse derivations.



Uploaded Model

If you uploaded a process model, it will be inserted in this editor.

The graph follows the rules of the [BPMN](#) notation.

You can drag & drop any objects from the object bar to the editor:



In the following, all symbols are explained in detail.



Hand Tool

Use the hand tool to navigate through the editor. You can (left-)click on any white space in the editor, and move the editor around.



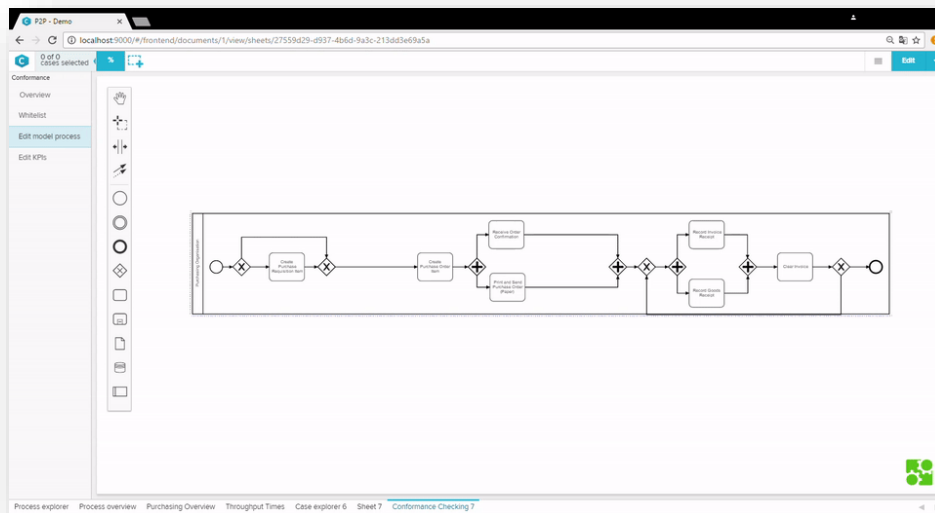
Lasso tool

With the lasso tool you can select multiple objects at once. Start at any point in your graph and adjust the squared lasso area to cover all desired objects.



Space tool

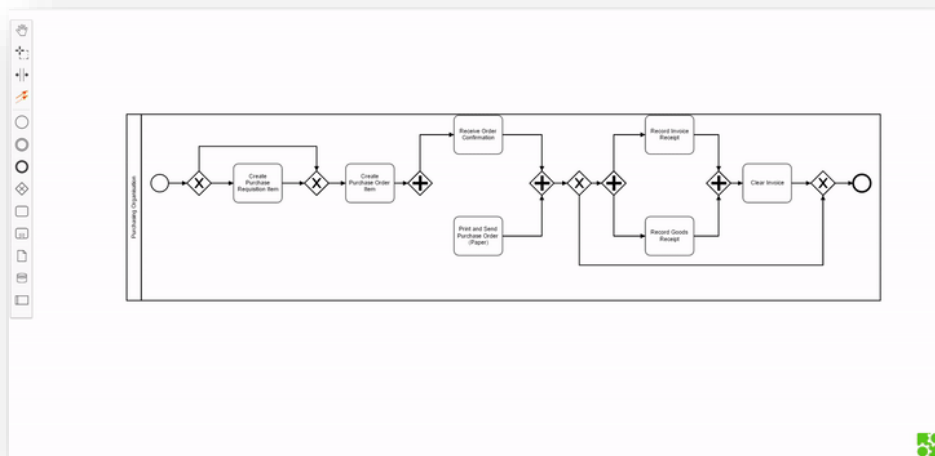
With the space tool, you can add/remove space between two objects. Any transitions between these objects will be adjusted automatically.



Global Connection tool

With the Global Connection tool, you can connect any objects.

Choose the tool and hover any object in the model, to check if it is available for connection. It will highlight green if it is, red if it isn't.





Start Event

All process models have to include starting activities.

Each sub-processes have to consist of exactly one starting activity.

Place this object anywhere on your sheet.

A Starting Event is required!



Intermediate / Exception

An Intermediate object is used to channel specific cases out of tasks.

However, they are not relevant for PI conformance and will hence be ignored.



End Event

All process models have to include ending activities to terminate the process model.

Just as starting activities, all sub-processes have to consist of exactly one ending activity.

Place this object after the last task/gateway in your process model.



Gateway


A gateway is a decision. You can choose between the following gateways:



Exclusive Gateway (default): This gateway considers only one process variant ("OR")

Parallel Gateway: All connected variants will be considered ("AND")

All other gateways are not relevant for SAP Process Mining by Celonis 4.2 process flows.

Hover any gateway and pick the  icon to change the gateway.

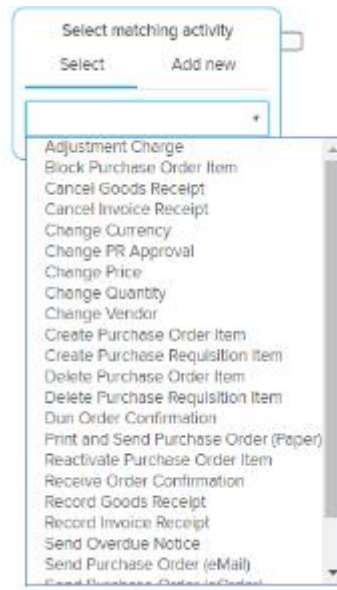


Task

Tasks are the basic entities in a process model, and are used to filter for activities.

Activities can be selected for each task.

Drag & Drop a new task into your process model. The following menu will appear next to the task:



All activities that are available in your data model will appear in this view.

Choose any activity from the dropdown list to continue.

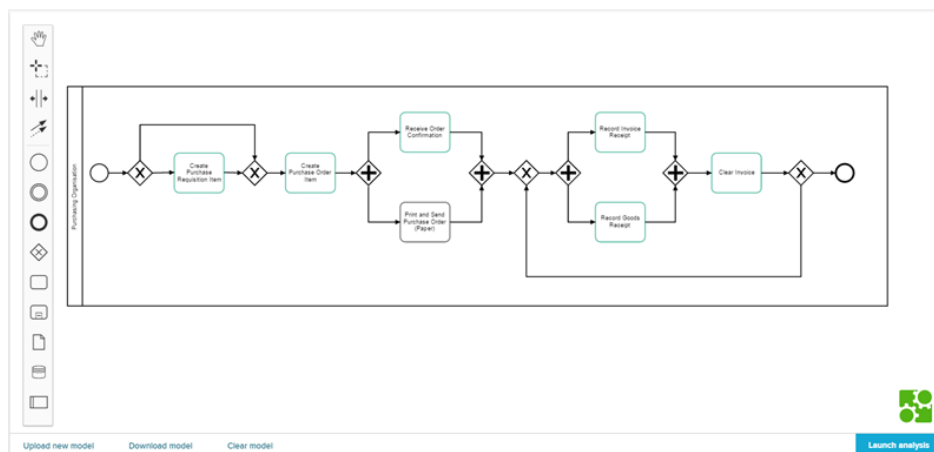
Please note

You can only select one activity for each task. However, you can make use of an unlimited number of tasks, to include more activities to your process model.



Pool

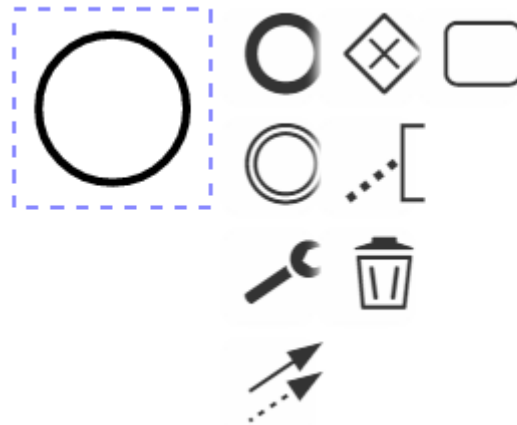
You can use a pool to group different sub - models.







However, a pool does not have any influence on your actual process flow.

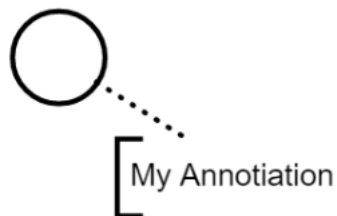
Tools

Every entity above comes with some tools, that can be used to configure your entity:




Use the    icons to create a new entity. It will be connected to your previous entity automatically.

You can add **annotations** to any object using the  icon:



Use the  icon to **delete** the selected object from your process model.

Use the  icon to connect your object to another object.

Please Note:

BPNM offers far more possibilities, than described in this section. However, these are sufficient to configure your desired process model. If you want to know more about the BPNM, please refer to the [official BPNM documentation](#).

7.1.4 EDIT KPIS

This section relates to the KPI section that is visible in the [Overview](#).

You can create your own custom KPIs in the *Edit KPIs* section.

Name

Total Throughput Time

Formula

`AVG(CALC_THROUGHPUT(ALL_OCCURRENCE['Process Start'] TO ALL_OCCURRENCE['Process End']`

Units

h

Subtitle

Enter a Name and a unit.

To enter your KPI statement, you can again use the well-known [Formula Editor](#).

Edit Formula

Total Throughput Time Formatting Custom Formula Units h

Undo Redo Copy Cut Paste Save to library Clear formula

average of (

TIME DIFFERENCE

FROM all occurrence of Process Start

TO all occurrence of Process End

BASED ON EVENTTIME of _CEL_P2P_ACTIVITIES in days

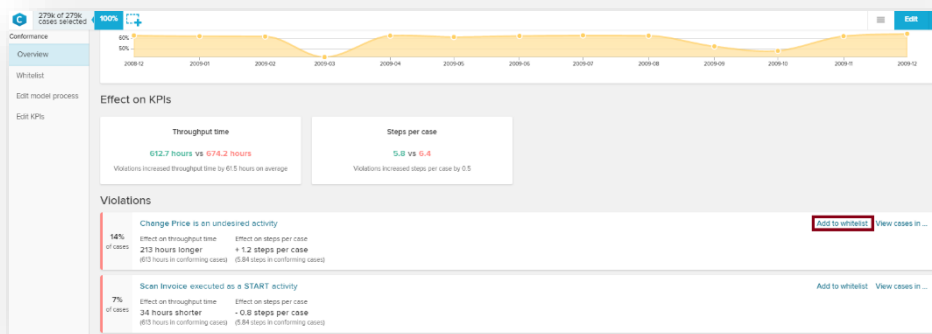
)

You can add an unlimited number of custom KPIs.

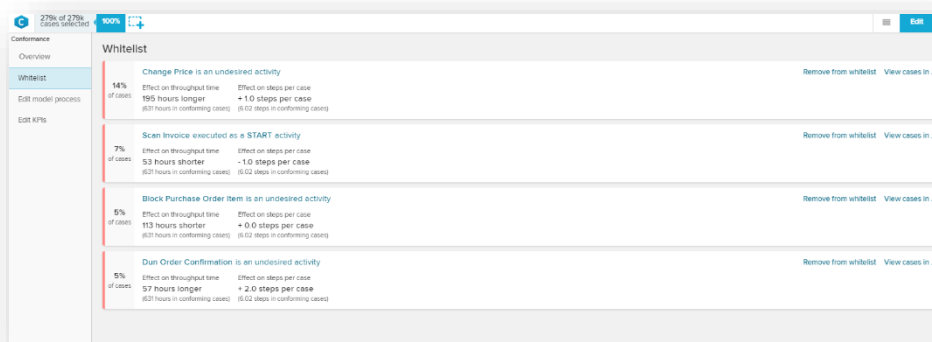
7.1.5 WHITELIST

The Whitelist lists violations to your [Process Model](#), that are tolerated. All process flows that are included in the Whitelist will thus not be evaluated as violations. This is useful to focus your violation analysis on specific valuations, and exclude intended or uninteresting process flows.

To **add violations to your whitelist**, open the [PI Overview](#) and move to the violations section. Every violation comes with an *Add to whitelist* link. Click on this link, to add a violation to the whitelist.



The violation will be removed from the current overview section, and is now included in your whitelist. You can view and edit all whitelist violations in the whitelist section:



Edit whitelist violations:

You can edit the whitelist violations just as you can edit any violations that are listed in the overview section. Simply click on a whitelist violation, and follow the instructions that are given in the Overview section. Use the Remove from whitelist link next to each whitelist violation to remove this violation from the whitelist. It will be inserted in your overview section again.

7.2 PI COMPANION

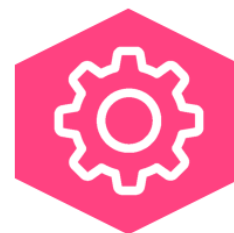


Companion

The PI Companion brings the full power of Process Mining exactly to the place where the actual process is executed. Right next to all SAP transactions the PI Companion allows all users immediate insights on his actions. Are the right choices made? Should the standard be adapted? Where do we usually lose money and time? All decisions in your daily business will be backed up by concrete numbers and facts, so every user can make better and faster decisions in his daily work.



Use case



Installation Guide

7.2.1 PI COMPANION USE CASE

Learn how the PI Companion can improve your daily business and decisions in all parts of a process.

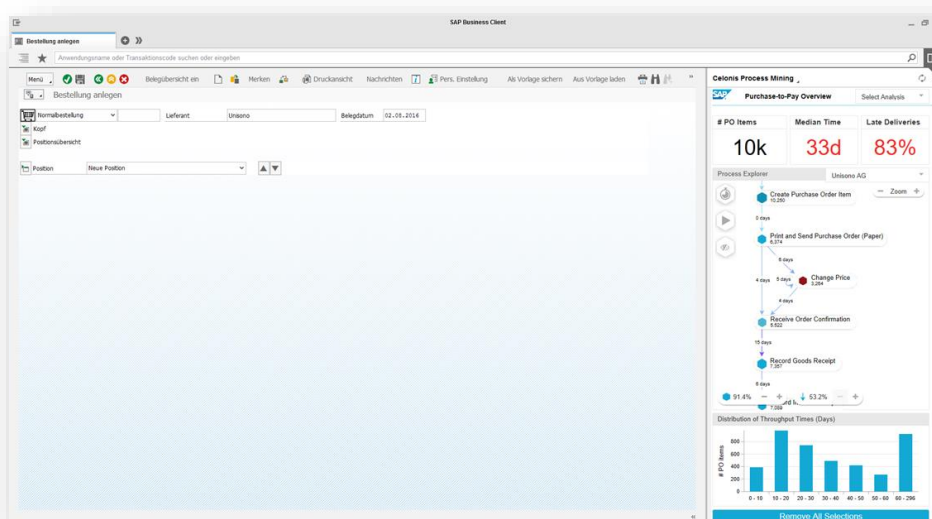
Choose the right vendor with the help of the PI Companion

In the daily business of any purchasing organization you are faced with the problem to choose from whom you will order your next purchase. The PI Companion can help to facilitate the transition to a fact-based-purchasing decision.

Process Details right next to all SAP Transactions

During the creation of a new purchase order in the SAP Transaction ME21N the PI Companion brings full transparency to the Purchasing Process and how your Organization performed in the past. Common process deviations are immediately obvious and all users' awareness to the major problems in the daily business is sharpened. In our example it is immediately obvious that the Purchasing Organization has a major problem with too many Price Changes.

The smart data-exchange between the SAP NWBC and the PI Companion filter down the Analysis to exactly the Vendor you have put in the transaction. It gets obvious that the usually preferred vendor had 3254 Price changes the past year. A clear indicator the purchase should be done with an alternative vendor. Within seconds you could adjust the chosen vendor to avoid unnecessary Price Changes and improve your overall performance.



7.2.2 PI COMPANION INSTALLATION GUIDE

Learn how to set up the PI Companion.

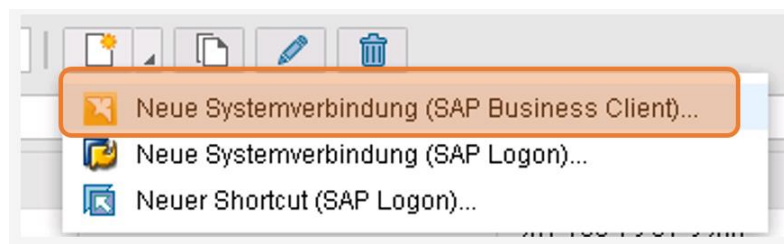
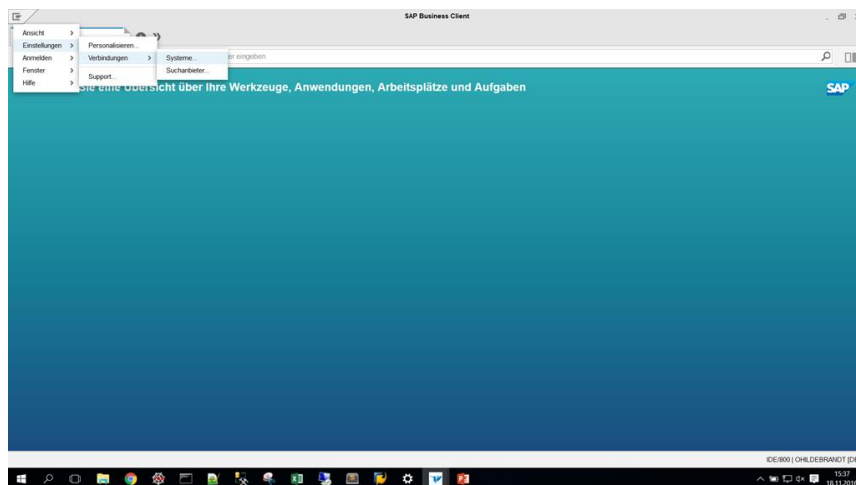
- [Prerequisites](#)
- [Create a Connection to the SAP Business Client](#)
- [Create a role for side panel users](#)
- [Add a side panel to the Transactions](#)

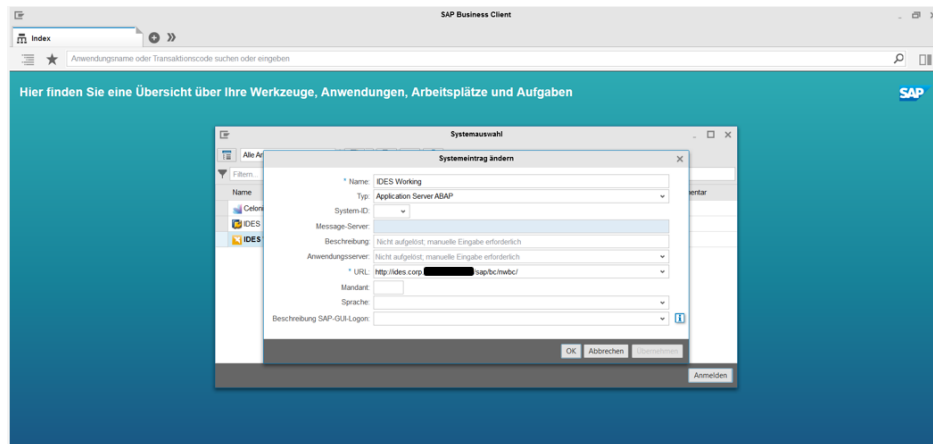
Prerequisites

- SAP NWBC (**Recommended Version: 5.0**)
- SAP Side panel must be enabled in the Business Client

Create a Connection to the SAP Business Client

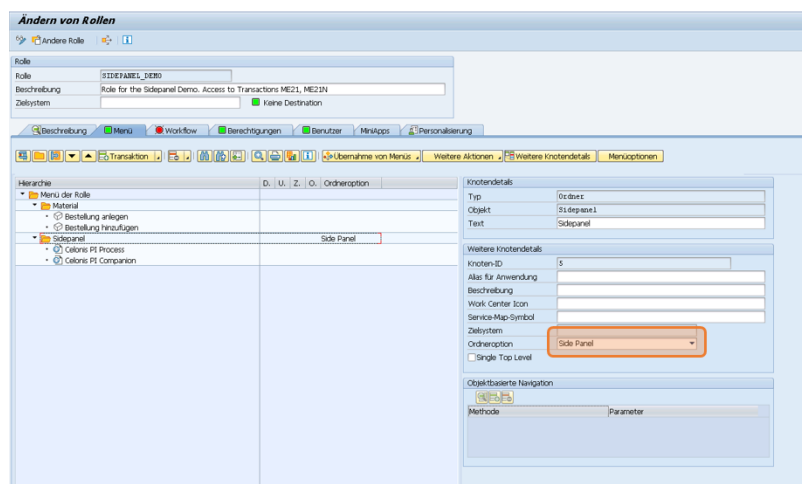
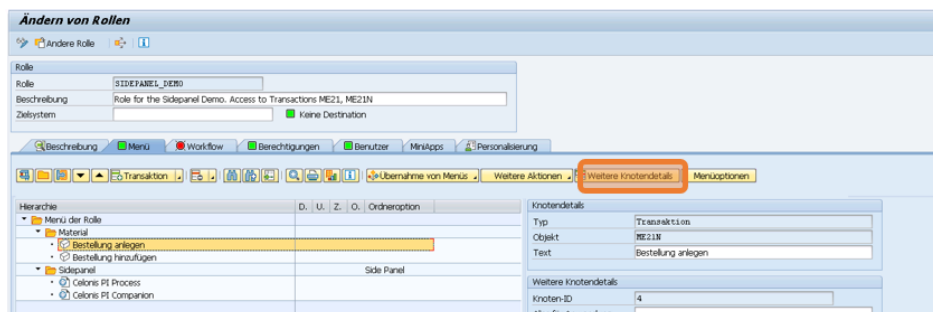
1. After starting the SAP NWBC, open the dropdown on the top left corner.
2. Create a new connection to the SAP Business Client.
3. Set the connection details and confirm.





Create a role for side panel users

1. Open the transaction 'PFCG'
2. Put in the name of the role and click create
3. Go to the menu tab in the role editor
4. Click 'additional node details'
5. In the role specify the Transactions that are accessible by the user
6. Click '+Transaction' and put in the TA code and description



Add a side panel to the Transactions

1. Go to the menu tab in the role editor
2. Add a folder and call it for example 'Side panel'.
 - a. DoubleClick the folder and set the folder option in the additional node details to 'Side panel'
3. Add a side panel to the folder
 - a. Click the small arrow at the left of '+Transaction' and choose 'File or Web address' from the menu
4. Enter the title for the PI Companion Page in the 'Text' input field and copy the URL to your desired analysis sheet
 - a. Important:

Change the parameter right after the document ID to **side panel**

Example:

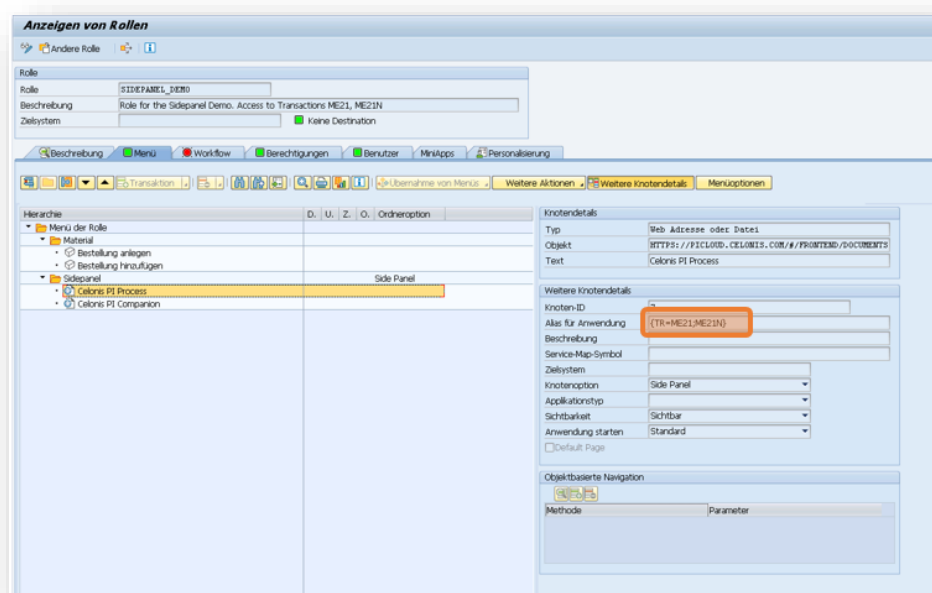
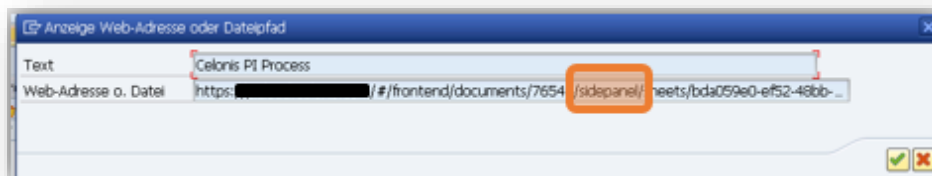
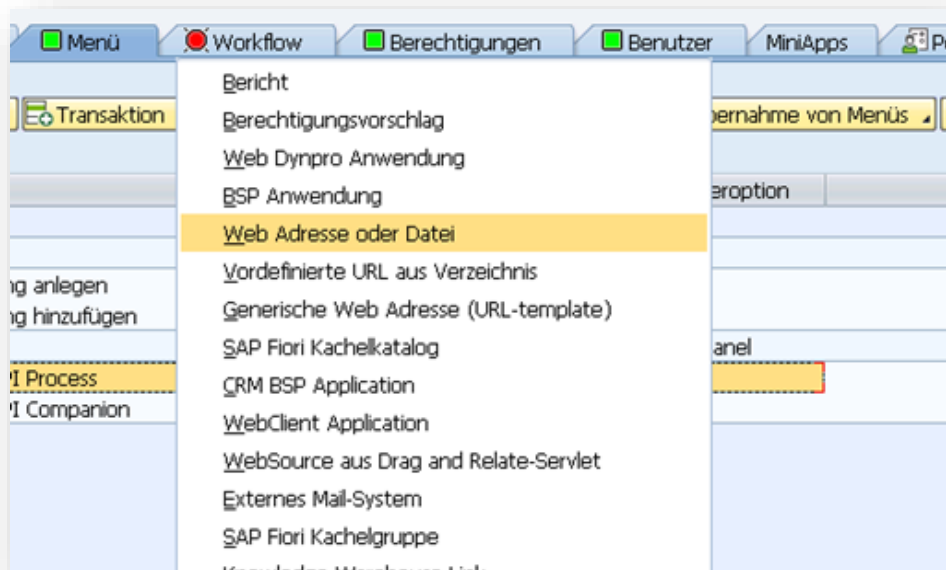
SAP Process Mining by Celonis 4.2 Analysis ID:

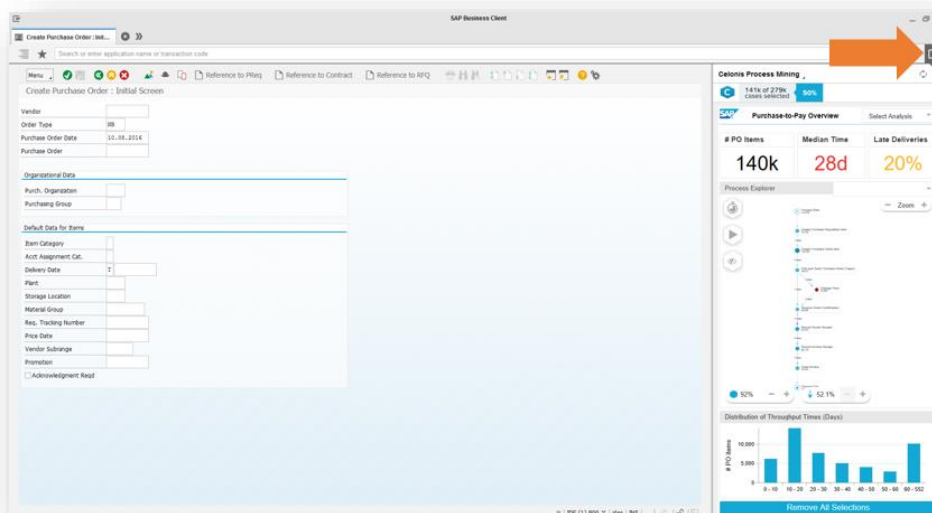
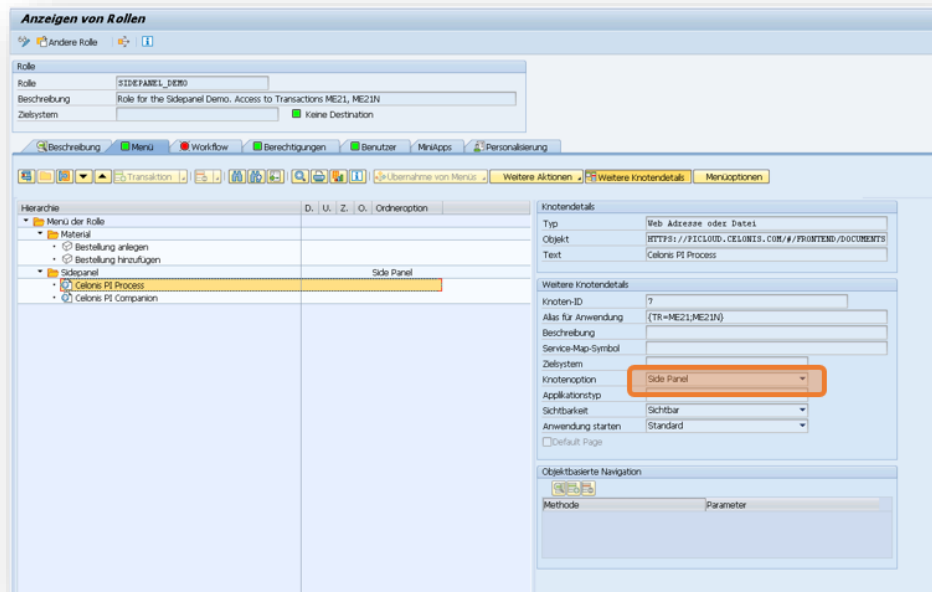
`http://<host>:<port>/#/frontend/documents/<documentNumber>/view/sheets/<id>`

Enter in the textbox:

`http://<host>:<port>/#/frontend/documents/<documentNumber>/sidepanel/sheets/<id>`

5. DoubleClick the new node and set the node option to **Side panel** in the additional node details
6. Set the Alias: The alias defines the Transactions for which the side panel will be active. The syntax is {TR=<TA1>;<TA2>;...}. For ME21 that results in: {TR=ME21}
7. Now save the role and all users that have the previously created side panel role will see PI Companion Analysis. The just set User roles can be assigned to a user in the Transaction SU01





7.3 PI MACHINE LEARNING



Machine Learning

Combine all the powers of Process Mining with the most advanced machine learning and A.I. capabilities. PI Machine Learning allows you to use the full power and all available implementations of the most popular statistical language in the world. A full R-Integration into SAP Process Mining by Celonis 4.2 opens up all your analysis to an unlimited number of predefined algorithms and libraries. All the all native functionalities and superior data visualization capabilities of SAP Process Mining by Celonis 4.2 can be combined with this R-Integration.



Use-cases



Installation Guide



How to

7.3.1 PI MACHINE LEARNING USECASES

Learn how PI Machine Learning can be utilized to predict and forecast process events to help you improving all your processes.

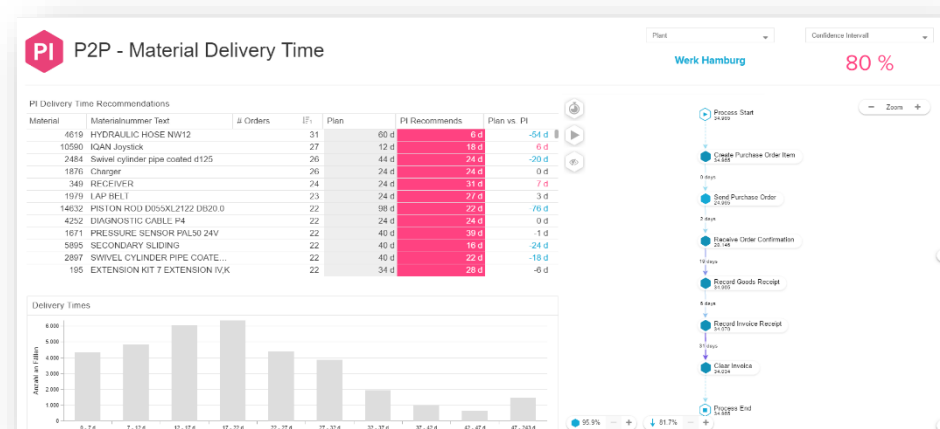
Improve your customer facing delivery reliability

One core problem in many companies is the customer facing delivery reliability. In many cases promised delivery times cannot be held and orders will be delivered significantly later than planned. Frequently missed delivery dates will set you under pressure of failing to offer an explanation and lower your customer's satisfaction significantly.

Planned your delivery times

In our example we take a look at a purchasing organization. In all purchasing organizations a planned delivery time for each order is set whenever a new order is placed. It is of great importance that these planned delivery times are estimated correctly. On the one hand, you will pile up too much goods if you always order too early and your warehousing costs will explode. On the other hand, whole production lines might have to stop if the necessary goods are not arriving on time.

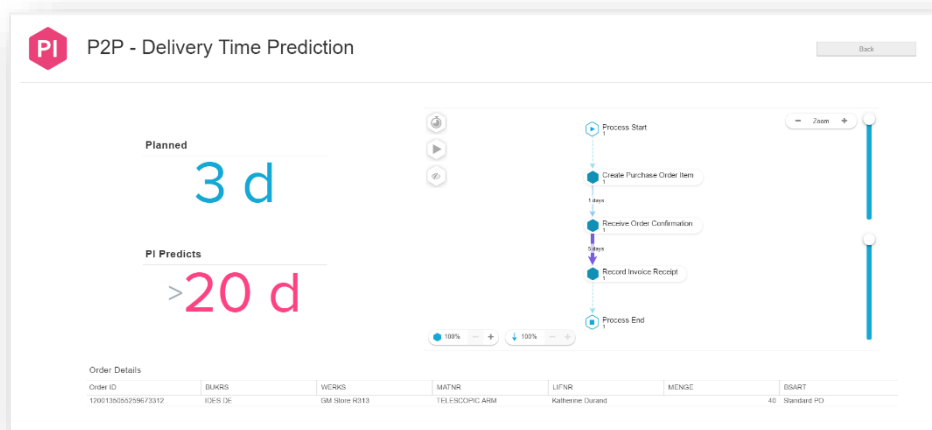
PI Machine Learning can leverage existing R-algorithms to recommend correct planning times. For example you can simply fit a distribution on delivery times and specific materials. Thereby it is possible to set a confidence interval for example of 80 %, implying you want to be 80 % sure a delivery is made after that many days. Fitted to all orders that were made in the past, PI Machine Learning can give you a recommendation, on how you should adjust your planned delivery times.



Predict when will my open orders arrive

Of course a good plan is a nice thing to have, but you also need to know how will my already open orders behave. PI Machine Learning allows you to utilize the most advanced machine learning algorithms from neural networks and deep learning to simply fitting algorithms to make predictions on all your open orders.

For example you can train a Bayesian Predictor on features like the material number, plant, vendor and many more to make a prediction on when will my order actually be delivered. All of a sudden it is possible to react to delays or early deliveries before they even happened. Of course, this will increase your own customer facing order reliability by light years.



7.3.2 PI MACHINE LEARNING INSTALLATION GUIDE

Learn how to set up PI Machine Learning for your installation.

- [General security considerations](#)
- [Installation Windows](#)
- [Installation Linux](#)
- [Install Rserve remotely on a Linux server](#)
- [Advanced configuration](#)

General security considerations

Never execute the R-Server as a root user. It's best to run the R-Server as a restricted user with limited rights. Be aware that a user with access to the R-Server can potentially delete all files for which he has write permissions. Under Linux and new versions of Windows Server 2016 it might be advisable to run the R-Server inside of a Docker container.

Installation Windows

For windows, we recommend using the Microsoft R Open interpreter, which is available for download at: <https://mran.microsoft.com/download/>. Next, you need to install the deployr-rserve library, which takes care of the communication between CPM and R. Deployr-rserve is available at

<https://github.com/Microsoft/deployr-rserve/releases>.

Download the Windows zip file (at the time of writing deployrRserve_9.0.0.zip). Afterwards, navigate to the Download folder in a command line. Then execute:

```
R CMD INSTALL deployrRserve_9.0.0.zip
```

where deployrRserve_9.0.0.zip stands for the filename of the file you just downloaded. You might have to give the full path to R for this to work, so something like:

```
"C:\Program Files\R\R-3.3.2\bin\x64\R" CMD INSTALL "C:\Program Files\R\deployrRserve_9.0.0.zip"
```

Now open the R interpreter (as a restricted user, see section "Security considerations") and execute:

```
library(deployrRserve);
rservePath <- system.file(package="deployrRserve", "Rserve.exe");
cmd <- paste(file.path(R.home(), "bin", "R"), "CMD", rservePath);
system(cmd);
```

The Rserve instance should now be ready to use. Note that on some Windows systems the pathnames don't get constructed properly. There you might have to convert the Rserve Path to have a format like "C:\PROG~\R" instead of "C:\Program Files\R". All that remains is to edit your config.properties for CPM. Simply add the following lines to your config.properties:

```
rserve.enabled = true
rserve.port = 7004
```

Now you should be ready to use the R-Integration. Note that you will have to restart the Rserve server manually after a system restart.

Installation Linux

Most distributions should provide the R interpreter in their package system.

For example in Arch Linux: `pacman -S R`

In Ubuntu: `apt-get install r-base`

After you have performed the R-Setup, start up the R-Interpreter (as a restricted user, see section "Security considerations!"). On the command line type:

```
install.packages('Rserve')
```

A window with a list of mirrors will open, just select one close to you and Rserve is installed. The most likely reason for any error messages here is that your firewall blocks your connection. In such a case please consult your system administrator. Next, load the Rserve library and start the server:

```
library(Rserve);
Rserve();
```

All that remains is to edit your config.properties for CPM. Simply add the following lines to your config.properties:

```
rserve.enabled = true
rserve.port = 6311
```

Now you should be ready to use the R-Integration. Note that Rserve will be started as a daemon and therefore keep running after you exit the interpreter. You will have to restart the Rserve server manually after a system restart.

Install Rserve remotely on a Linux server

tested system: Ubuntu

```
$ sudo apt-get install r-base
```

```
$ R
```

```
> install.packages("Rserve")
```

```
// run the Rserve instance and make it available remotely
```

```
> library(Rserve)
```

```
> Rserve(args='--vanilla --RS-enable-remote')
```

```
> q()
```

Run Rserve daemon from console without running R:

```
$ Rscript -e "library(Rserve); Rserve(args='--vanilla --RS-workdir /home/ruser/workdir --RS-enable-remote')"
```

Test remote server access:

```
$ telnet remoteServerIP 6331
```

Advanced configuration

There are three other configuration options in the `config.properties`:

- `rserve.hostname`: Sets the address where the Rserve instance is running. The default value is `127.0.0.1` (i.e. localhost)
- `rserve.timeout`: Sets a timeout for an Rserve query. After the end of the timeout no further attempt to receive the requested data is made and an error will be displayed.
- `rserve.terminate`: If set to true, processes running queries that passed the timeout will be sent a SIGKILL signal. This should terminate the process completely, but might leave some resources hanging.

7.3.3 PI MACHINE LEARNING HOW TO

Learn how to actually use PI Machine Learning within SAP Process Mining by Celonis 4.2.

- [Overview over R-Support](#)
- [RCALL](#)
- [Difference between RCALL and RAGG](#)
- [RCALL examples](#)
 - [K-means clustering](#)
 - [Regression](#)
- [RAGG examples](#)
 - [Skewness](#)
- [Further Information](#)
 - [Writing efficient R-Code](#)
 - [File Access](#)

Overview over R-Support

R can currently be used to calculate additional columns for use in table and plotting components. There are two different functions for interacting with R: **RCALL** (Relative Call to Subroutine) and **RAGG**.

RCALL executes a user defined R-function for a given set of columns (which can be pre-aggregated by the user using PQL commands). RCALL should return exactly one value for each line of input.

In contrast, **RAGG** operates on groups and will return one value for each group of data. **RAGG** operates similar to PQL aggregation commands like AVG.

RCALL

The syntax of an RCALL statement is simply:

```
RCALL(COLUMN1 AS VAR1, COLUMN2 AS VAR2, ..., 'StringWithRCommand')
```

so for example:

```
RCALL("MYTABLE"."MYCOLUMN" AS SOMEDATA, "MYTABLE2"."MYCOLUMN7" AS MOREDATA, 'f <- SOMEDATA + MOREDATA')
```

RCALL can take an arbitrary number of arguments. The first n-1 arguments to RCALL are named like columns from your data model. The last argument is an R script, that has access to the previously defined columns via their names defined in the AS part. The syntax of an RAGG call is similar.

You can use PQL queries inside of RCALL statements. The data you will receive will depend on which columns you define (similar to TABLE statements).

For example:

```
RCALL("MYTABLE"."MYCOLUMN" AS GROUP, SUM("MYTABLE2"."MYCOLUMN7") AS MOREDATA, SUM("MYTABLE2"."MYCOLUMN7") AS SOMEDATA, 'f <- SOMEDATA + MOREDATA')
```

With this example, you should receive aggregated values for MOREDATA and SOMEDATA.

You can load arbitrary libraries within your R program, as long as they are installed on the server hosting Rserve. Simply preface your script with regular library(PACKAGENAME) calls.

Difference between RCALL and RAGG

In the most simple example of an RCALL statement the provided column is just returned immediately:

```
TABLE("EKPO"."BELNR", RCALL("EKPO"."BELNR" AS MYFANCYVAR, 'rvar <- MYFANCYVAR'))
```

Here 'rvar <- MYFANCYVAR' is a very simple R program, in which the contents of the column "EKPO"."BELNR" are assigned to the variable rvar. The contents of rvar are then returned. In this case, switching from RCALL to RAGG would deliver the same result. However, using RAGG here will result in a significant performance penalty, because it would be executed for each entry in BELNR (each entry being treated as its own group).

The classic example for RAGG would be a call to the mean function:

```
TABLE("skewness.csv"."Group", RAGG("skewness.csv"."Value" AS VAL, 'mean(VAL)'))
```

Here we calculate the mean value of the column "skewness.csv"."Value" for each distinct "skewness.csv"."Group" entry.

RCALL examples

K-means clustering

A very simple example of clustering is shown in the app "Kmeans". In the k-means dataset there are 4 obvious clusters in the data. These clusters are easy to find visually, but in larger, multi-dimensional datasets an automatic method becomes necessary. K-means is one of the most straightforward methods for determining clusters. In the Kmeans column we show an example R Call to perform Kmeans clustering. The syntax is:

```
RCALL("Kmeans.csv"."x" AS "X", "Kmeans.csv"."y" AS "Y", 'df <- data.frame(v1=X, v2=Y); k <- kmeans(df, 4); k$cluster')
```

Here `k$cluster` is the vector with group numbers that is being returned. Note that the Kmeans method starts from different starting point each time it is invoked. Hence you might end up with a different cluster numbering each time the method is invoked.

Regression

Real data is often noisy, but we might be able to describe it by some simple mathematical model. For example, we might want to ascertain the trend in some dataset by fitting some known function to it. A simple example of such a fit is shown in the app "Regression". The underlying dataset was generated by adding Gaussian noise to a simple polynomial.

```
RCALL("Regression.csv"."x" AS X, "Regression.csv"."y" AS "Y", 'model <- lm(Y ~ X + I(X^2) + I(X^3)); fitted(model)')
```

RAGG example

Skewness

Skewness is a measure of the asymmetry of a distribution. Positive skewness indicates that the distribution is skewed towards the right, negative skewness that it is skewed towards the left.

We can calculate the Skewness using the RAGG aggregation operator:

```
RAGG("skewness.csv"."Value" AS VAL, 'library(e1071); skewness(VAL)')
```

Note that we load a library here, which needs to be installed on the server hosting Rserve.

Further Information

Writing efficient R-Code

It's almost never a good idea to write for loops in R. Most functions work on vectors and are significantly faster that way.

File Access

If the user running the R interpreter has file access somewhere, you can save and load R-objects from that directory. This is especially useful if you have long-running scripts that you only need to perform once.

In such cases, it is often better to store the result on disk after performing the calculation once, so that it can simply be loaded back in subsequent calls.

```
x <- c(1:10)
```

```
save(x, file="someFileName")
```

Here we saved the vector containing the numbers from 1 to 10 in a file called "someFileName". We can later load the vector in again simply via:

```
load("someFileName")
```

Note any other assignment to the variable x will be overwritten by the load statement.

7.4 PI SOCIAL



PI Social

With PI Social, you can understand how your team is working!

It gives you detailed views and performance results as it connects users and activities that are tracked in your data model. After creating a PI Social sheet, you first need to choose the columns containing the users in the process. The distinction of usernames in this section are used to determine a user. "John Smith" and "J. Smith" are considered to be two different users. (The information can however furthermore be stored as user identifier (e.g. "CW031").)



Activities



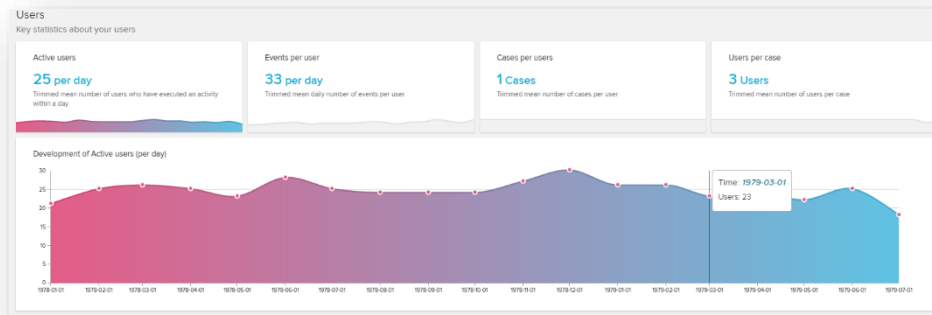
Overview



User

7.4.1 PI SOCIAL OVERVIEW

The overview is the entrypoint to the analysis of your teams performance. First off it shows you the main KPIs and their development over time.

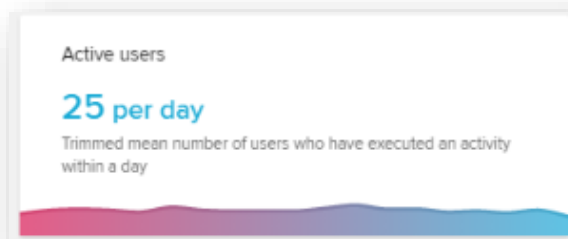


This **first section** is made of 4 KPIs and an [Area Chart](#), sketching the development of active users per day over a given time period (see below).

The following KPIs are available:

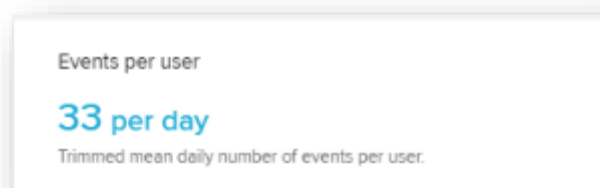
Active users

Mean count of users that have been active per day performing any activity in the given time period.



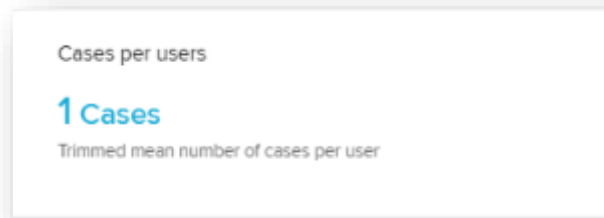
Events per user

Mean count of events (= performed process activities) that a user has completed per day in the given time period.



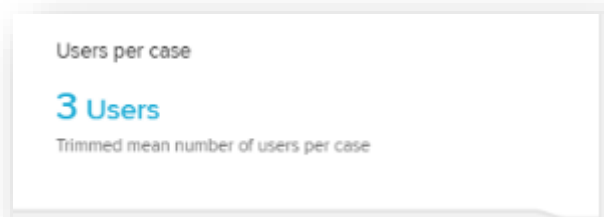
▼ Cases per users

Mean count of cases (without regarding their individual number of passed activities) that a user has been working on per day in the given time period.

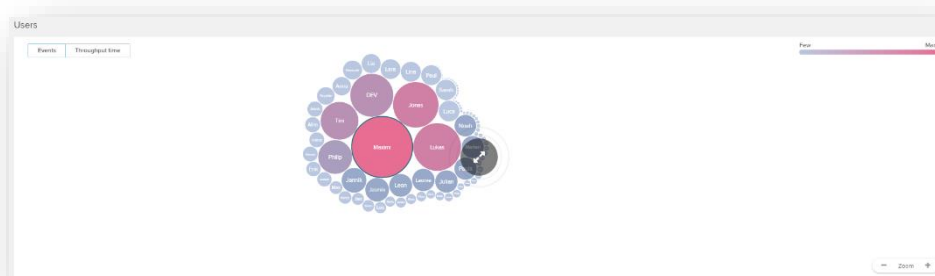


▼ Users per case

Mean count of users that have been working on the same case per day in the given time period.

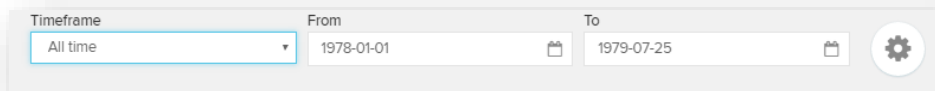


In PI Social, every user has a user profile, which evaluates the activities and cases that he has been performing. This feature is available in the [Users](#) section. Click on the following view in your PI Social to access the Users section.



Time

As already mentioned, the PI Social analysis is based on a given time period. This time period can be configured in the upper right corner of the Overview section:



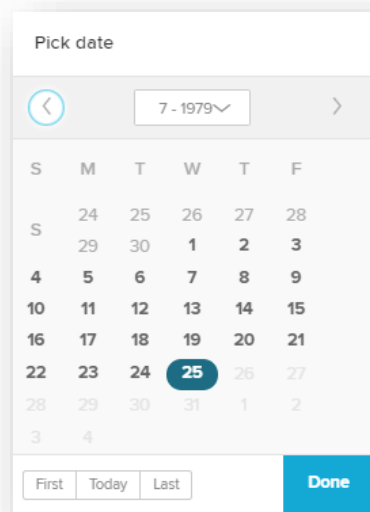
The screenshot shows a configuration bar with three main sections: 'Timeframe', 'From', and 'To'. The 'Timeframe' section has a dropdown menu currently set to 'All time'. The 'From' section contains a date field with '1978-01-01' and a calendar icon. The 'To' section contains a date field with '1979-07-25' and a calendar icon. A gear icon for settings is located on the far right.

Choose a **timeframe** in the dropdown-menu.

You can choose between some given pre-sets (Last 7/30/365 days, all time) or define a custom time period with the *From* and *To* datepicker. Choosing a pre-set, the *From* and *To* fields will be adopted accordingly.

Please Note:


Please note, that the datepicker fields hide all days, that have not been assigned any activity to, in a grey color. They cannot be picked to border your timeframe.

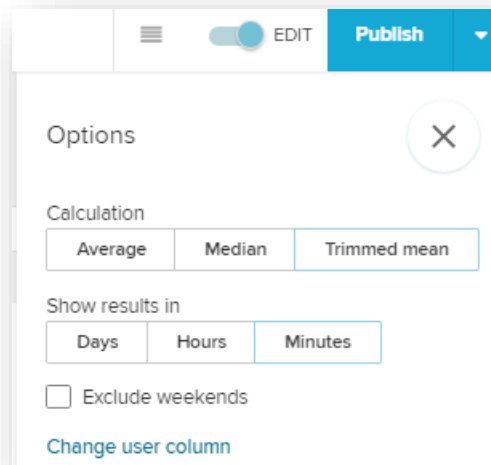


The screenshot shows a 'Pick date' modal window. At the top, there are navigation arrows and a range selector showing '7 - 1979'. Below this is a calendar grid with days of the week (S, M, T, W, T, F) as column headers. The dates are arranged in rows. The date '25' is highlighted with a dark blue circle. At the bottom, there are buttons for 'First', 'Today', 'Last', and a prominent blue 'Done' button.

The defined time period is the base for the whole PI Social analysis.

Configuration

There are some further configuration options available with the  icon:



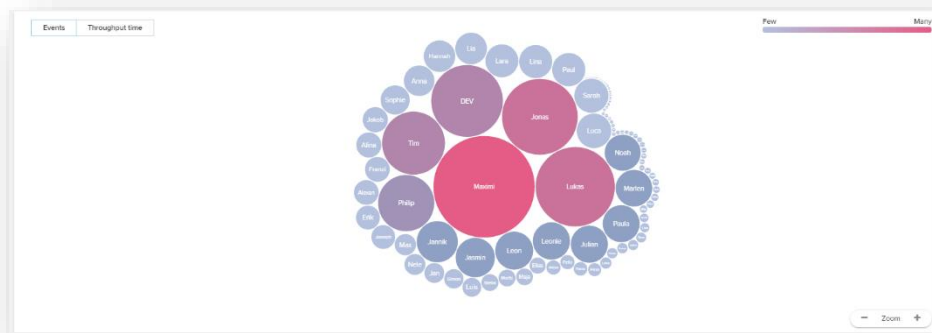
With these options, you can base the counting algorithms on an **Average**, a Median or a **Trimmed mean** (default). Furthermore, you can show all results in the charts and KPIs in days, hours or minutes.

The *Exclude weekends* checkbox will only focus the user analysis towards activities that have been performed on working days (to be set in the global [System Settings](#)).

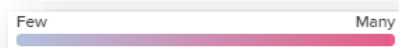
7.4.2 PI SOCIAL USERS

This section offers the core functionality of the PI Social.

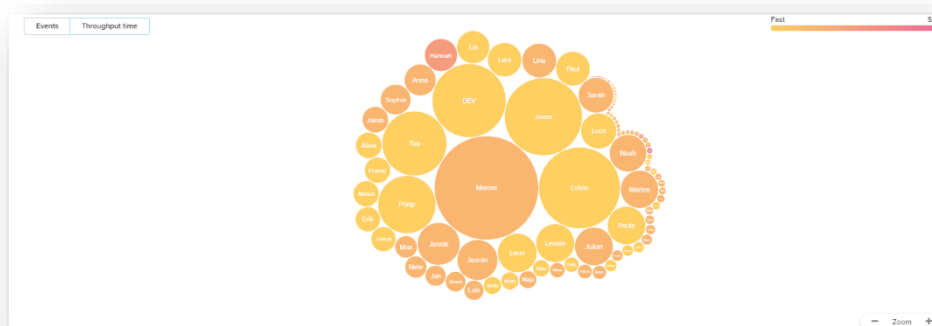
It introduces a **bubble chart** with all existing users.



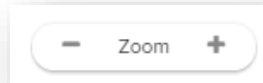
Users are scaled colored differently. The **scaling** follows the mean number of events (=activities) that a user performed per day (in the given time period). The coloring follows the given legend in the upper right part.



Using the buttons in the upper left corner, you can change the coloring, which can either base on the number of performed events per day or the throughput time (=the time, that users need to perform activities).

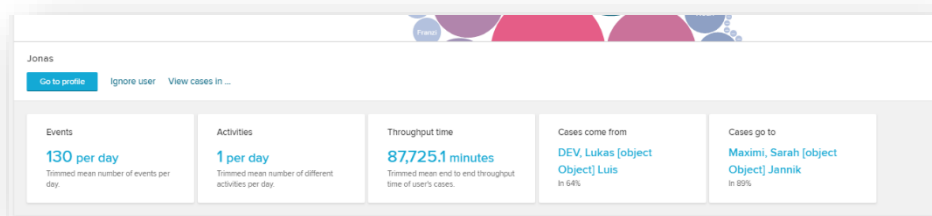


Don't forget about the zoom buttons in the lower right corner.



Click on any user to open a quick overview of his profile. Use the [Go to profile](#) button to open it.

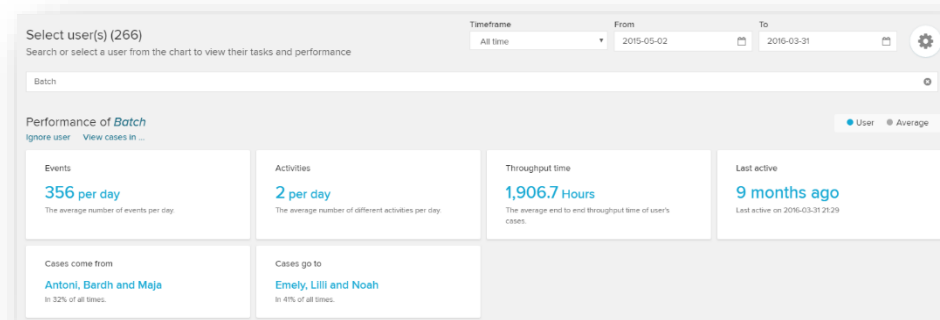
Let's have a look at Jonas performance:



You can furthermore **ignore** this user (which will remove him from the bubble chart) or open his/her cases in an analysis sheet (with a global selection for these cases).

7.4.2.1 PI Social User Profile

All listed users in your data model are assigned a user profile in PI social. The upper section of a user's profile offers some general options, KPIs and timeframe settings. The timeframe settings are the same that we already introduced in the [Overview](#).

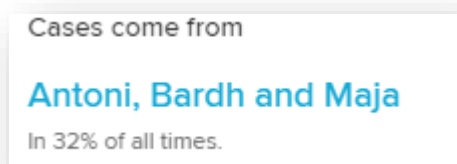


Next to the three well-known KPIs (Events per Day, Activities per day, Throughput time) a **last active** KPI is introduced in the first row.

This KPI simply displays the time that has passed since the user has been active in the system (and performed any activity). The following additional KPIs are introduced in the second row:

▼ Cases come from

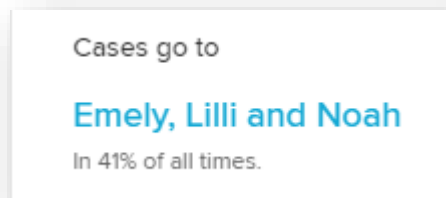
This KPI displays the three (other) users that worked on a previous activity in the most common process variant. The variant's share is displayed in the grey text below the users.



▼ Cases go to

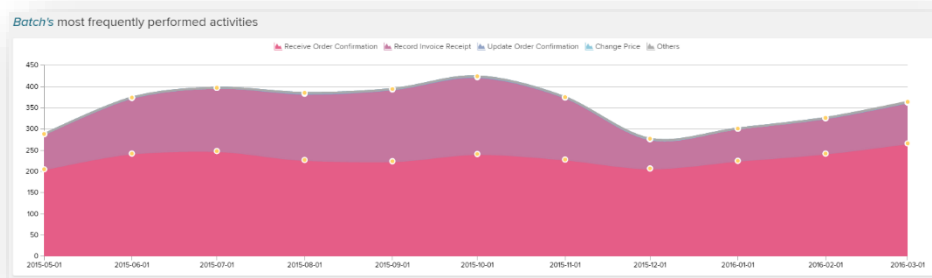
This KPI displays the three (other) users that worked on any subsequent activity in the most common process variant.

The variant's share is displayed in the grey text below the users.



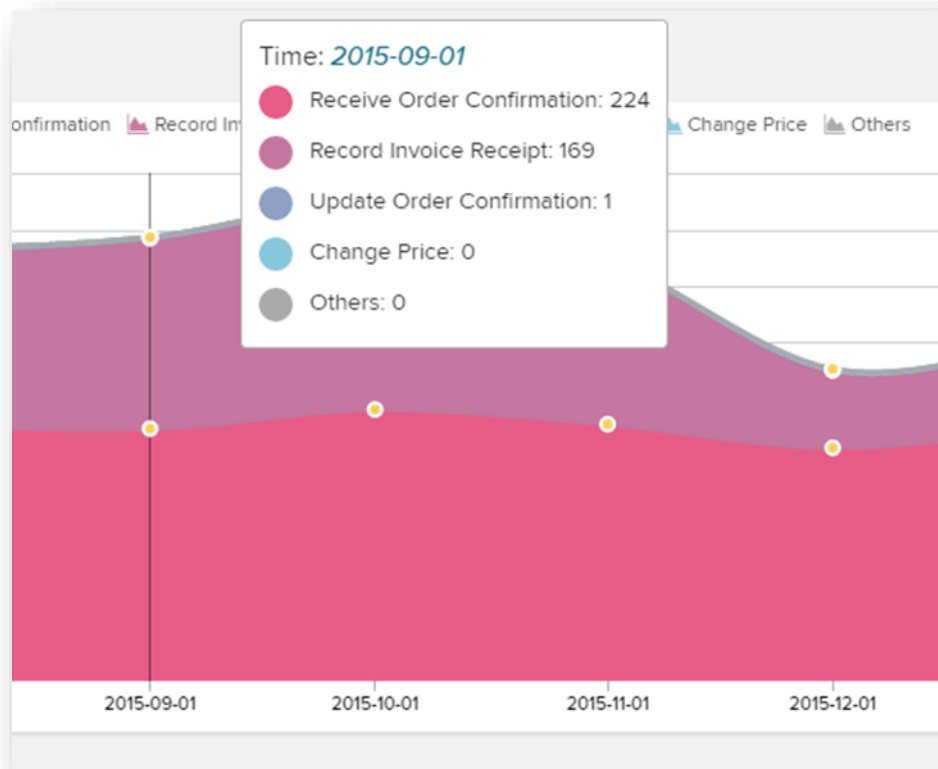
As you will notice, this KPI is very similar to the *Cases come from* KPI.

The following [Area Chart](#) reports on the user's most frequently performed activities.



Activity Performance Details

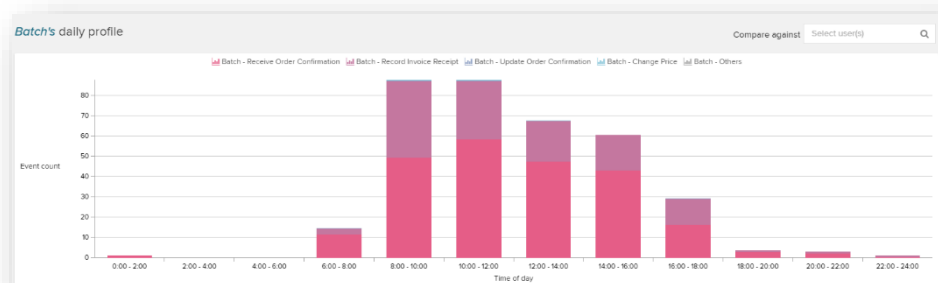
Hover the chart area, to see a detailed evaluation of the selected timestamp, including all performed activities



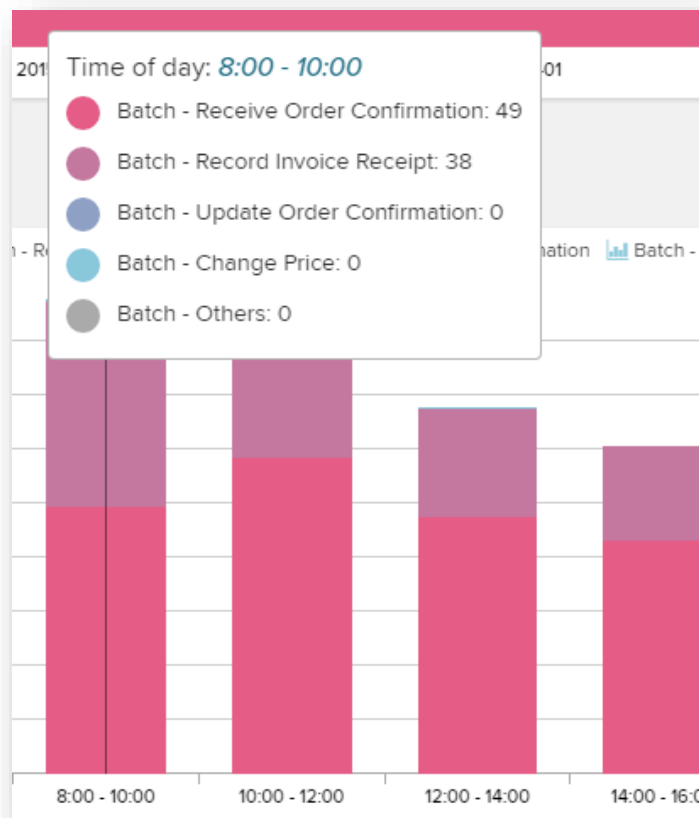
There is another chart at the bottom of the user's profile.

The **daily profile** chart comes as a [Column Chart](#) and provides an evaluation on the activities that have been performed on a most common variant - day.

Therefore, the day is split up into 2h - timeframes.

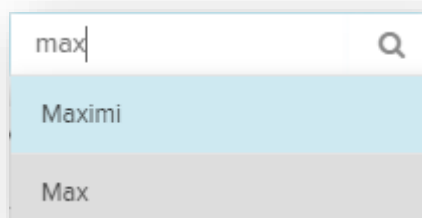


Hover any column to see a detailed evaluation:

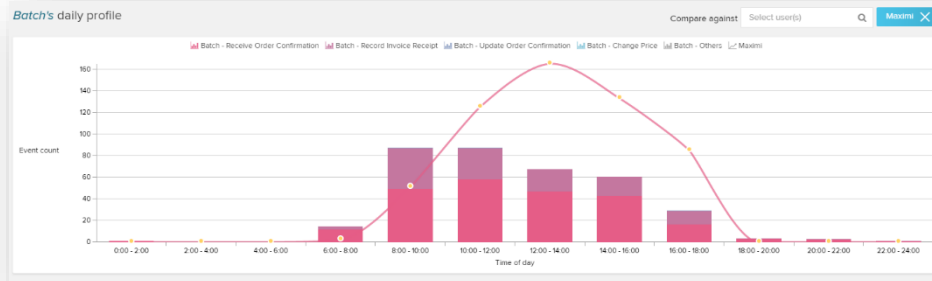


Compare Users:

You can compare the performance of multiple users with this tool. Enter one (or multiple) other users in the search field in the upper right corner of the chart area, and choose a user from the dropdown list.

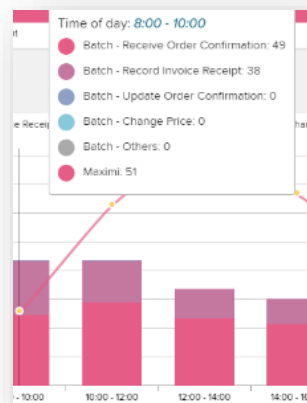


The (new) selected user's performance will be included in your chart with a line:



When hovering a column, the performances are compared.

The users that have been selected in the search field will however only be considered in absolute numbers, adding up all activities that have been performed in this timeframe.



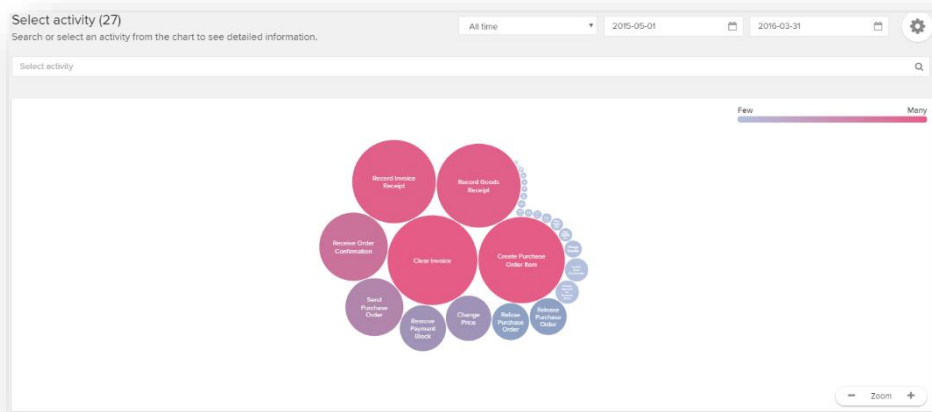
You can see all users that are compared to the current user's profile next to the search bar:



Use the white cross next to the usernames to remove the user from the comparison.

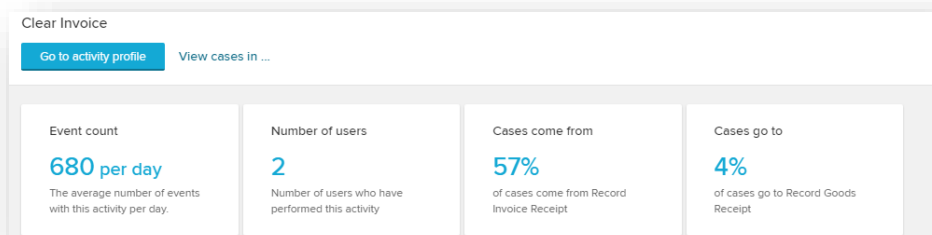
7.4.3 PI SOCIAL ACTIVITIES

Just as you can get a detailed overview on users, you can analyse activities for their performing users.



The bubble chart reports on all activities with different colors and sizes, which follow the frequency of their usage.

Click on any activity to access the details:

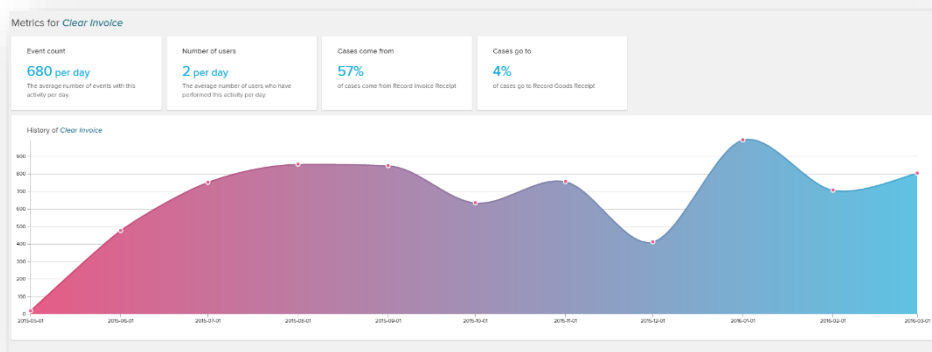


7.4.4 PI SOCIAL ACTIVITY PROFILE

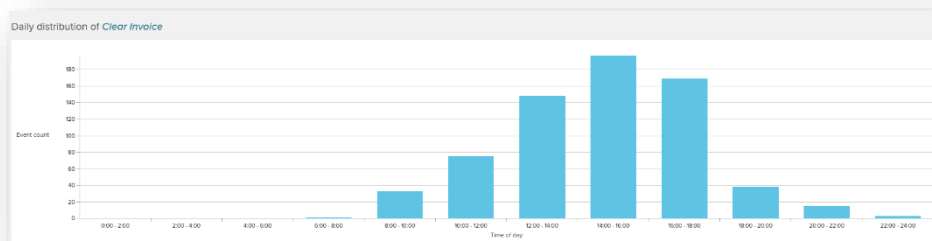
For all activities, a profile is created - just as the [user profile](#).

In the upper part of the profile, you will find an [Area Chart](#) reporting on the usage frequency of this activity over time.

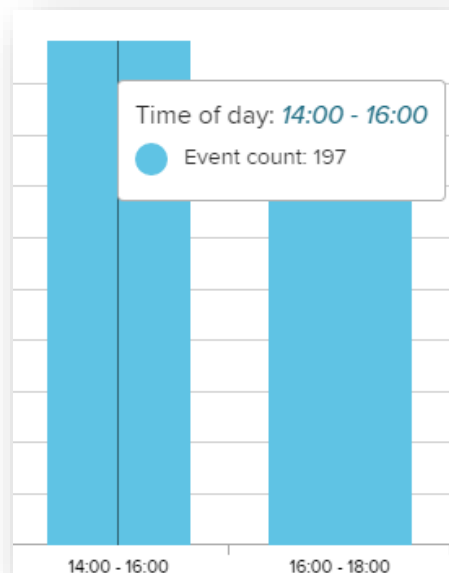
Furthermore, 4 KPIs are available. They display the event count, number of users per day, previous-/following activities on an average/median basis, depending on your timeframe settings.



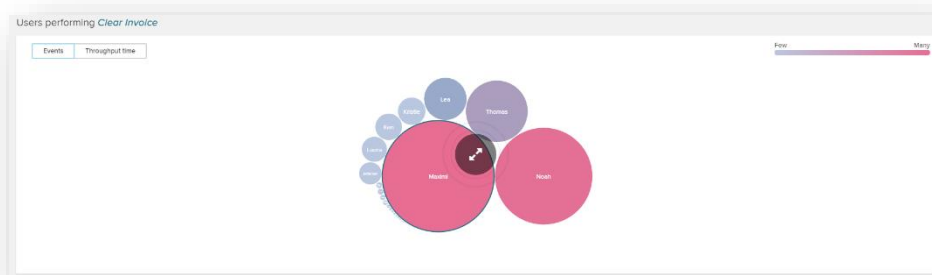
The lower part of the screen is covered by the daily distribution of the selected activity.



Hover over any column to see a detailed count of the activity in the selected timeframe.



Between those two charts, you will find a user overview.



Please note however, that this overview is restricted by your current activity.

Please follow the instructions in [PI Social Users](#) to get a detailed explanations on the user profiles.