

minuit

getting started

Version 3.1

Welcome to Minit

Minit is a smart software for the analysis of a large number of business processes. Minit can utilise the records stored in the majority of enterprise information systems such as LOB, CRM, ERP or BPM tools. Our technology can speed up the process analysis several times, by using the combination of the latest data-processing algorithms and techniques.

Minit automatically creates process models and displays the communication within business processes. Minit also clearly visualises statistical information and offers the possibility of creating charts according to users' needs. It provides the user with advanced analytical functions using a wide range of options for filtering and animations of the progress of recorded events.

Regardless of the volume of data that your systems generate, Minit will process them at an unprecedented speed. Easy detection of the inefficiency of processes is possible thanks to the frequency, time, and procedural indicators.

Minit is suitable for the analysis of all types of processes – production, financial, administrative, IT, and logistics, but also, for example, processes in the healthcare, logistics, or telecommunications sector. Whether you are the owner of the process, an auditor, consultant, analyst, senior manager, or worker included in the course of the process, Minit brings the added value for every user by saving the time and effort required for the analysis of processes.

About this Guide

This Quick Start Guide will provide you with an overview of Minit's main features.

With the help of this document and two real-life process logs which we provide with Minit installation, you can try the work of a process analyst immediately after installing the tool.

The Template Processes section of this Guide describes the processes from which the logs were extracted and used in the previews of each of the tool's functionalities.

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Template Processes

This section includes the Purchase Order Process and the Invoice Approval Process. The data of both processes were anonymised. You are given the option to install these Demo processes during the Installation of Minit software.

01.1

Purchase Order Process

The ordered items are defined by a set of attributes.

After having created a new order, it is automatically launched into the Purchase Order Approval process. The system then selects, based on the entered data, the approver in a tree of authorised users/group of the lowest level of authority to approve the Purchase Order. Subsequently, the system assigns the approver(s) tasks by informing them by email notifications.

The approver may then approve or reject the orders. After the approval process, the system can decide, based on the financially authorised limit, if the level is sufficient enough to approve the order made and, if not, there will be a reselection process from the existing tree of authorised users/group of higher authorities.

This process is repeated until all authorised approvals are met. When the order process is deemed approved in the system, the author will be notified of the outcome or status change to "Approved".

If the order has been rejected, the system will change the status to "Declined", and a notification will be sent to the appropriate author as well as the reasons for rejection.

After the rejection of a process order takes place, the order ends.

In case of approved orders, the system identifies whether it is a cyclic order.

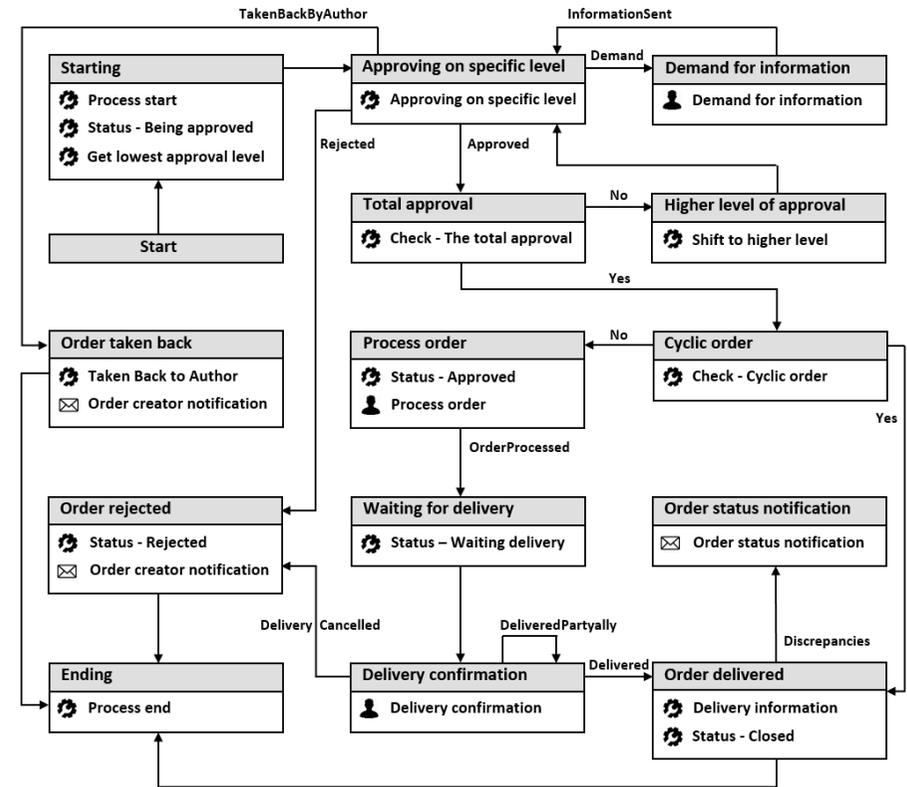


Fig. 1. Process diagram of the Purchase Order process.

¹ If the process is identified as a cyclic order, the system will automatically mark this order as delivered and the process will come to an end. Cyclic orders are characterized by regular repetition.

01.1

Purchase Order Process

If this is not a cyclic order, it continues and assigns tasks to persons related to the ordering process who have been designated by the author of the orders during its creation.

In this part of the process, the user will have established and forwarded approved orders with its suppliers. The process then continues to confirm receipt of the ordered goods/services.

The system will then assign tasks to those employees who were assigned during the creation of the order process.

These employees are then given a chance to confirm a completed delivery order, confirm any partial deliveries, or cancel the order if the customer had cancelled the order. When a partial delivery takes place, the employee can wait for a delivery of any missing parts of the ordered goods, or they can declare the order as partially delivered.

Subsequently, the system will treat the order as a "Closed" order, and the process will come to an end.

Figure 1 indicates the BPMN process diagram of the Purchase Order process. The Process consists of 4 human tasks and 16 system tasks. The Demo process consists of the above mentioned 4 human tasks only. Table 1 lists all of the process attributes extracted from the source system.

Attribute Name

Description

CaseID

Case identifier

Activity

Activity identifier

Start timestamp

Event start time

End timestamp

Event end time

Resource

Resource performed event

Attribute Name	Description
EventType	Type of event (human or server event)
ActivityStatus	Status of activity
EventStatus	Status of event
ActivityFinalAction	Action by which the event was finished
CaseStatus	Status of case
CostCenter.Code	Code of cost center
CostCenter.ID	ID of cost center
OrderStatus.Code	Status of order
OrderTotalAmountWithoutVAT	Order price
Supplier.City	Supplier City
Supplier.Name	Supplier Name
Supplier.State	Supplier State

01.2

Invoice Approval Process

The process is automatically initialised as soon as an invoice is scanned / digitised.

In the beginning, the system automatically assigns invoices to the correct order. If the order was not found, the system will generate a task for the manual entry of the order number.

This task is assigned to the "Accountants" group, and the goal is to find the order and pair it with the respective invoice. After assigning the order, the system automatically compares the total amounts.

If the amounts do not match, the system will check the correctness of the cost centre and continues to process the invoice in the approval process.

The approval process part has the same procedures as the Purchase Order Approval process. Subsequently, the system will generate tasks to confirm the accounted invoice. In this part of the process, the employee will check all other information pertaining to the invoice. If they did not find any discrepancies in the invoice, the system will generate tasks to complete the accounting part/accounts payable process of the invoice, whereby the process will come to an end. However, if an employee finds irregularities, the process will continue, and the system will generate tasks to solve any discrepancies. At this point, the employee may reject the invoice, and the process ends, or, obtaining any missing data will then enable the system to return the invoice to the re-approval state. Figure 2 shows the BPMN process diagram of the Invoice Approval process. The process creates 7 human tasks and 13 system tasks. The Demo process consists of all the above-mentioned human and system tasks.

Table 2 lists all of the process attributes extracted from the source system.



Fig. 2. Process diagram of the Invoice Approval process

Attribute Name	Description
CaseID	Case identifier
Activity	Activity identifier
Start timestamp	Event start time
End timestamp	Event end time
Resource	Resource performed event
EventType	Type of event (human or server event)
ActivityStatus	Status of activity
EventStatus	Status of event
ActivityFinalAction	Action by which the event was finished
CaseStatus	Status of case
CostCenter.Code	Code of cost center
CostCenter.ID	ID of cost center

Attribute Name	Description
OrderStatus.Code	Status of order
OrderTotalAmountWithoutVAT	Order price
Supplier.City	Supplier City
Supplier.Name	Supplier Name
Supplier.State	Supplier State

First steps in minit

Minit v3 offers brand new, project oriented structure where you can create and export as many projects as you need, based on your customers, tasks or areas of interest. The project is a container for your processes, it organizes them and groups them together.

The favorite concept of views – persisted interactive states of analysis, became the core element of the project.



02.1 Project Hub

Project Hub is the main and starting screen of Minit. It gives you an overview of projects, imported processes and created process views and it allows you to manage them.

Open the prepared process views in your Demo projects by clicking the corresponding tile and jump to chapter 03 or start a new analysis (incl. data import) by clicking the + icon and continue with chapter 04.

The screenshot shows the Minit Project Hub interface. At the top, there's a navigation bar with the 'minit' logo, 'Project hub', and a user profile for 'Standalone Administrator'. Below this, the main content area is titled 'Minit Demo Project' and shows a grid of process views. The grid is organized into two sections: 'Invoice Approval' and 'Purchase Order Approval'. Each section contains several process view tiles, each with a title, a small diagram, and a 'create new view' button. A '+ ADD PROCESS' button is visible in the top right corner of the main content area. Callout boxes point to various elements: 'Share project' points to the top left; 'Manage your projects in this panel' points to the left sidebar; 'Manage the process, refresh data' points to a tile in the 'Purchase Order Approval' section; 'Processes and Process views available here' points to the bottom left; 'Set the connection, options, manage ongoing tasks and display help' points to the top right navigation area; and 'Start new analysis' points to the '+ ADD PROCESS' button.

Share project

Manage your projects in this panel

Manage the process, refresh data

Processes and Process views available here

Set the connection, options, manage ongoing tasks and display help

Start new analysis

Fig. 3. Project Hub with selected Demo project

Automated Process Discovery in minit

The core functionality of Minit is the automatic reconstruction/discovery of the process map based on the sequences of events recorded in the log. That is why the first step of making familiar with the process in Minit is through a process map.

Usually, when you first look at the process map, you can get an idea of the distinction between how the process should look like and what it really looks like. To go deeper into the process analysis, additional functionalities are needed such as filtering of process data, detailed statistical information and analysis of the resources involved in the process through the social network. These and other functionalities can be found in the Process Explorer, which represents the analytical part of Minit.

During the analysis of processes, it is essential to store the individual examination results/findings and be able to return to them at any time. This activity is provided by the Project Hub in Minit, which also organizes all of your process mining projects.



03.1

Process Explorer

The Process Explorer, shown in Figure 4, is the main manager of all the knowledge obtained from the imported log. It allows analysis of process data from different perspectives (Animation, Variant, Chart, ...) through intuitive visualisation. Under the heading of the currently displayed screen (upper left), you can switch between views saved with the analysed process.

On the left side of the screen, there are buttons for navigation in the Process Explorer. Click the back arrow to close the currently open view and return to the Project Hub. The closed view is always saved automatically.

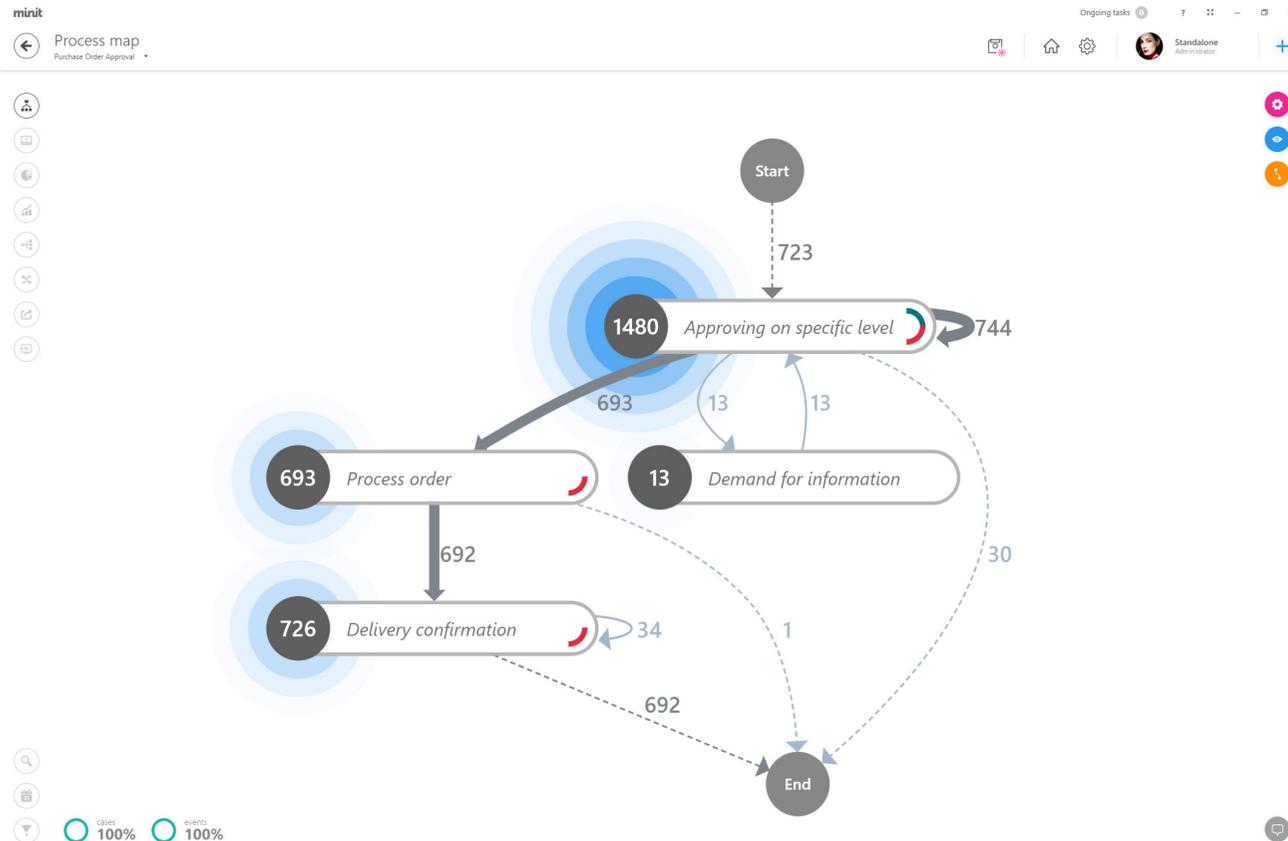


Fig. 4. Process Explorer in Minit



03.1

Process Explorer

The bottom left of the Process Explorer screen includes indicators of the current volume of process instances and events. The number of process instances, with which you work, is influenced by the filters used. Click the indicators to display the list of used filters with a description of each Setting as shown in Figure 5. Click a filter list item to go directly to the filters screen.

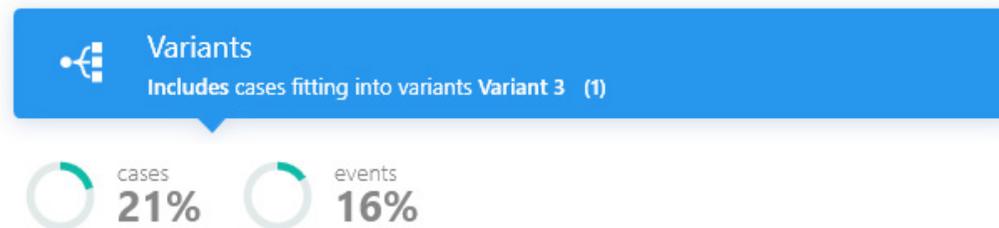


Fig. 5. Process Explorer in Minit



03.1

Process Explorer



Process map

The mined process is displayed in the form of a process map or a social graph. Here, you can see the structures and links of steps and resources in the process.



Process animation

Here, you can see and analyse the dynamics of the process.



Chart

Dependencies and distributions in the process under analysis can be displayed here.



Statistics

The screen with a summary of statistical information about the process.



Variants

Here, you can explore different process performance variants, their quantity, and the progress of individual cases over time.



Process compare

In this part of the Process Browser, you can compare the views created from processes and explore their differences.



Export

On this screen, you can export the analysed process data into an external file in various formats.



Search

Use this button to search for activities in the process map.



Filter

On the screen, you can use filters to help you filter out the required dataset.



03.2

Process Map

A process map describes the behaviour of the process captured in the process log. It contains activities and edges. An activity is a node in a process map, which represents a unique activity in the process. Oriented edges represent the relationship between the activities in the process and they describe the sequence of activities. Figure 6 shows a process map, which was reconstructed from human activities contained in the Purchase Order Approval process.

A process map can display frequency or performance metrics. The halo effect (the blue tinted circle) represents the overall ratio of the value of the monitored metrics of a certain activity versus other activities in the process map.

Activities also include indicators indicating whether it is the initial (the green indicator in the top right corner) or final (the red indicator in the bottom right corner) activity of the process instance. The map can also include special starting and ending nodes connecting initial and final activities.

The upper-right part of the screen includes buttons representing specific functionalities for working with the process map.

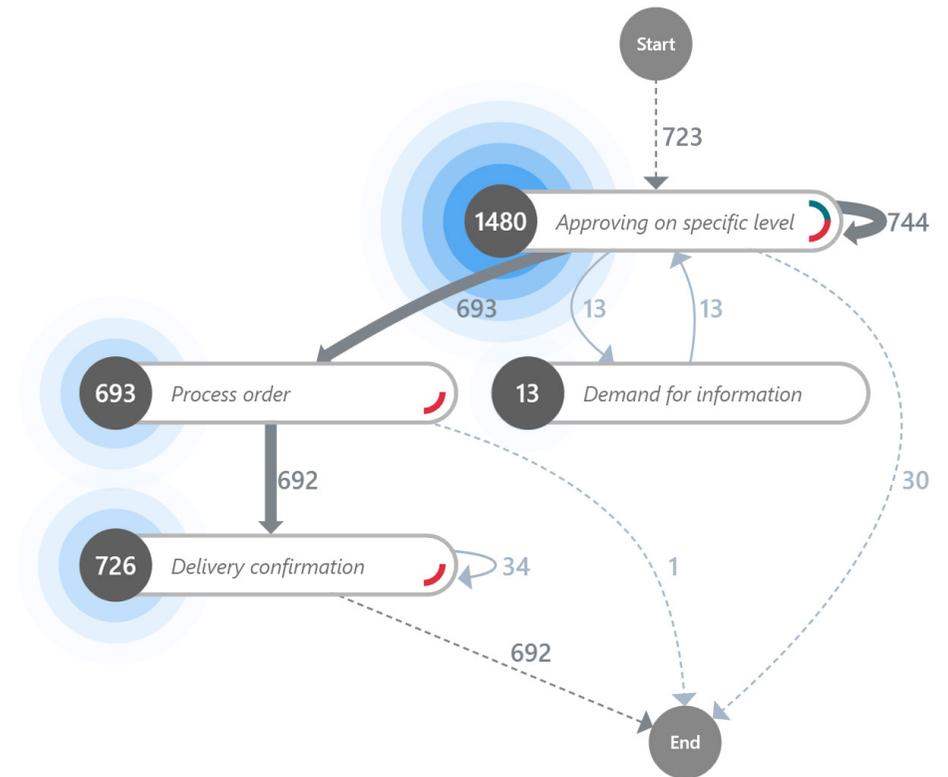


Fig. 6. Purchase Order Approval process map



03.2

Process Map

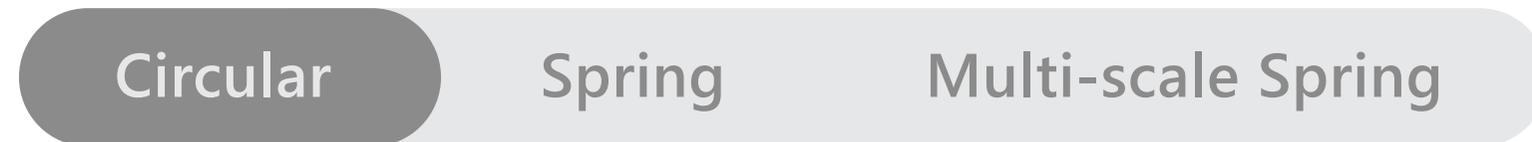
Through this control, you can influence the various visualisations of the process map, social network and information displayed on them.

Customize panel / Process view - Social view

Use this button to change the view on the process. The process map is the primary view. If you imported the process log which included resources (users), you could switch to the social network view that represents the communication of resources carrying out individual activities of the process. If you select the social network view, all data will be automatically recalculated and adapted to the analysis of the process resources. In this view, the customise panel offers various layouts of the social network view as shown in Figure 7.

You can try the way of working with the social network in the Purchase Order Approval process. In this process view, note the effect of the change on the process variants and statistics, for example. You can change the network layout, or you can try the animation.

You can try the way of working with the social network in the Purchase Order Approval process. In this process view, note the effect of the change on the process variants and statistics, for example. You can change the network layout, or you can try the animation.



(Note: It is not possible to switch to the social network view from the process map if a variant filter is active..)

Fig. 7. Different layout types of social network



03.2

Process Map

Customize panel / Process map options

Here, you can:

- show or hide special initial and final nodes in the process maps
- organise activities around the most frequent path of the process
- change the process map basic view orientation
- display only the activities that go before and after the selected activity
- cluster the map according to relevant attributes

Customize panel / Sliders

Sliders can be used to adjust the complexity of the process map. If both controls are set to 100 percent, the process map contains the complete behaviour of the process captured in the log (all activities and edges are displayed).

The work with sliders is demonstrated on the Invoice Approval process backbone identification. This process is quite complicated; it contains 21 activities, and the sequence is described by 60 variants

Figure 8 shows a process with all of the activities and edges sliders set to 100% on the left. On the right, the process backbone is displayed with activities and edges sliders set to 0%.

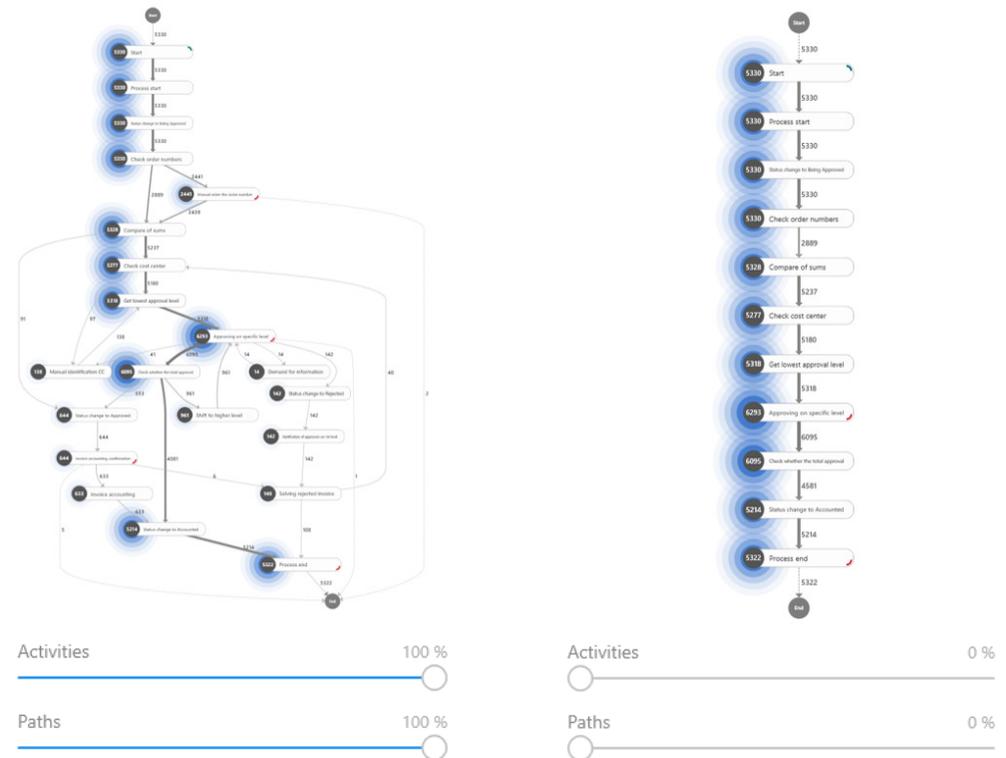


Fig. 8. All the details of Invoice Approval process on the left and process backbone on the right



03.2

Process Map

Customize panel / Process metrics

A process and social map can only display one of the frequency, performance or finance (If you imported the process log with attribute finance) metrics. The heat map below the metrics selector shows the range of values of the given metrics for activities and edges of the process map. Figure 9 shows a metrics control.

Customize panel / Export

You can export a process or social map as an image (.png) or as an XML file containing a list of activities and edges. The XML file can be imported into some BPMN tools to display the process map as a BPMN model.

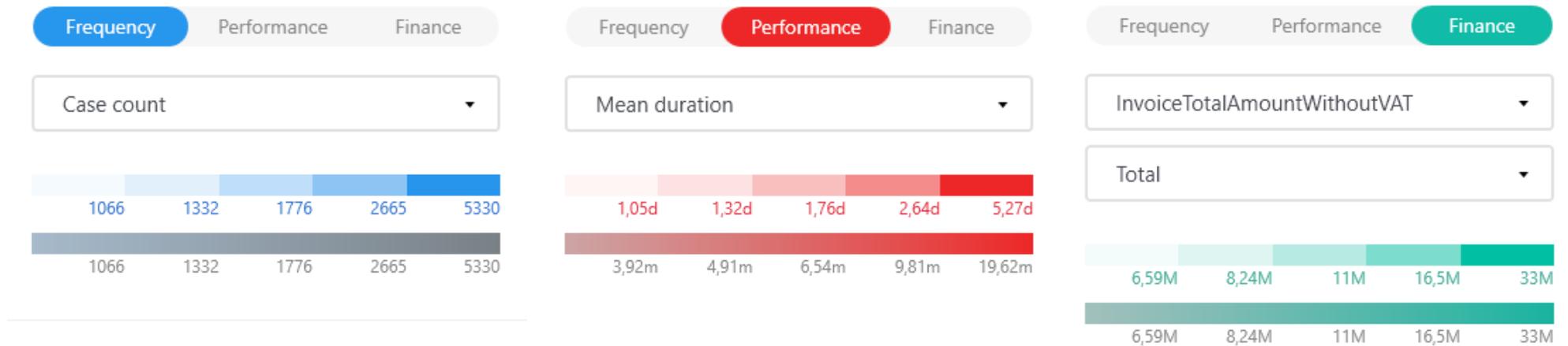


Fig. 9. Metrics selection with heat maps



03.2

Process Map

Visualize panel

This panel contains a preview of the process map in which you can display the desired part of the process map by scrolling. The panel also contains sliders for zooming and adjusting the horizontal and vertical offsets of activities in the process map.

Customize

Visualize ⌵

Map preview ⌵

Zoom ⌵

⌵
1:1
178

Spacing ⌵

Horizontal

Vertical

Reset

Variants

Newsfeed



03.2

Process Map

Variant panel

The Variant panel contains a list of variants created during the process reconstruction. Variants can be arranged according to the number of process instances that they group or by the number of events in case of variants. By clicking each of the variants in the list, the sequence of one or more variants in the process or social map will be highlighted. The selected variants can be filtered immediately on the filter screen by clicking the filter icon. Figure 10 shows the Variant panel.

When selecting one or more variants to the right of the indicator of the current volume of process instances and events, a coverage indicator of process instances by the selected variants is displayed at the bottom of the screen. If the complexity of the process map was reduced by scrolling elements, then not all of the process activities or edges are shown, and the number of not shown activities and edges of selected variants is displayed in the lower right corner.

By viewing variants in this panel, you can quickly find out, for example, how many variants describe 80% of the process behaviour and what is the flow of this behaviour.

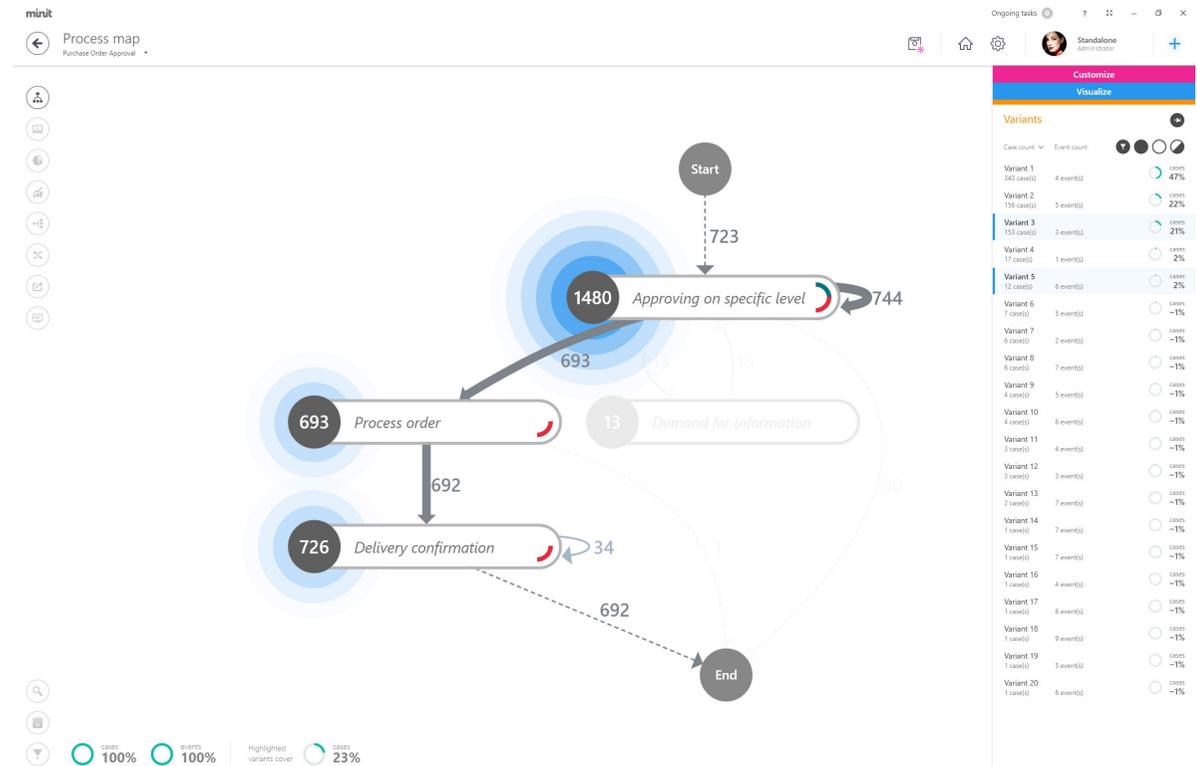


Fig. 10. Variant panel, selected variant 3 and 4



03.2

Process Map

Detail panel

The detail panel is displayed by clicking the activity or on the edge in the process map. The panel contains a list of frequency, performance and finance (If process log was imported with finance attribute) metrics. The panel also includes the "Top attributes" lists, which displays the event frequency metric for the selected attribute in the process. The number of displayed attributes and attribute values can be freely defined. The button to go to the filter screen and the button to show or hide the "Advanced panel" are located at the top of the panel.

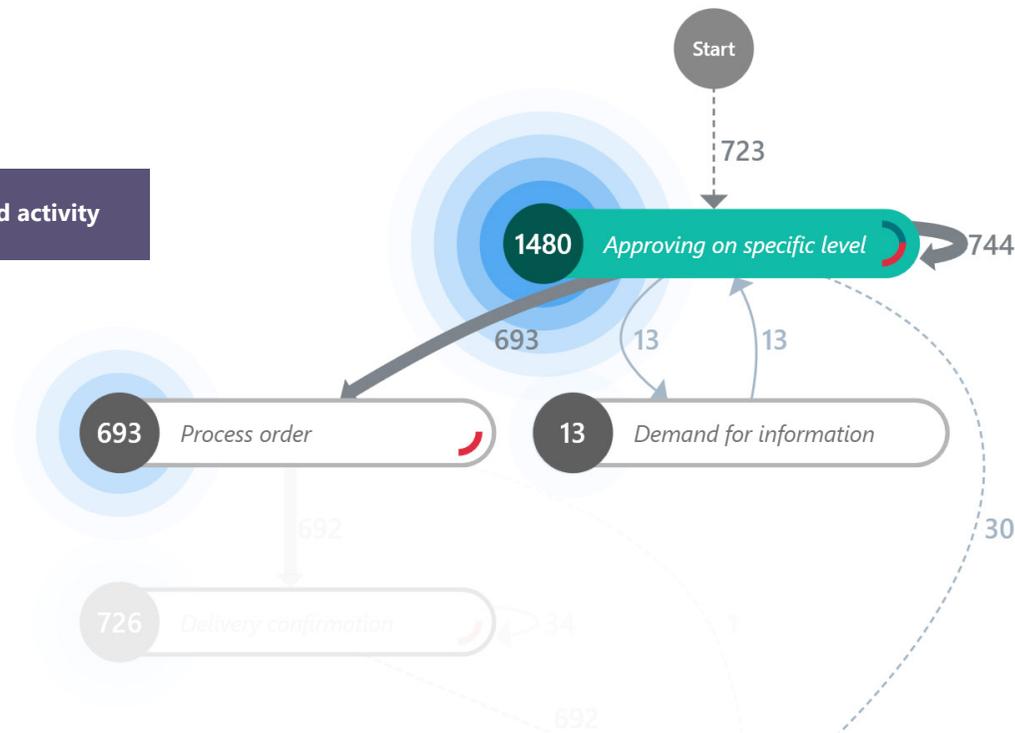


03.2 Process Map

Detail panel / Activity detail panel

The Activity detail panel is shown in Figure 11. In addition to the panel list, the panel in the frequency metrics list also contains the “First in case count” and “Last in case count” indicators showing the number of process instances where the activity was initial or final. The list of optional “Top attributes” is not limited in any way and it is, therefore, possible to add an imported one. Use the filter button to go from this panel to the filters screen with default filter data. Depending on your choice, you can go directly to the Attribute or the Endpoint filter.

Fig. 11. Displayed detail panel for the selected activity



Details ⏪ ⏩

Approving on specific level ⌵

Frequency

Total count	1 480
Case count	723
Max. repetitions	5
First in case count	723
Last in case count	30

Performance

Total duration	2y 11M 2d 9h 5m
Standard deviation	1d 21h 1m 28s 537ms
Mean duration	17h 24m 22s 94ms
Max. duration	25d 1h 45m
Min. duration	0

Financial analysis

OrderTotalAmountWithoutVAT ✕

Total	755 076,18
Standard deviation	3 086,00
Mean	1 044,37
Maximum	36 511,68
Minimum	0,00

Select attribute to add ⌵

Top attributes ⋮

Resource ✕

Cullen Cameron	288	19%
Kiera Gross	208	14%
Edon Carrillo	195	13%
Isabella Gill	94	6%
Naohne Cash	89	6%



03.2

Process Map

The Advanced panel for activities is shown in Figure 12. The Advanced panel displays a list of previous or subsequent activities with a selected attribute and an optional number of attribute values.

On this panel, you can display only the attributes that were marked as case-level attributes during the process import. Use the button on the top of the panel to switch to the list of previous or next activities.

Advanced details

Approving on specific level

Supplier Name

744 Approving on specific level

- Mus Institute 151 10%
- Lacus Foundation 49 3%
- Sodales At Veit Inc. 49 3%
- Malesuada Fringilla Company 38 3%
- Auctor Odio A LLC 34 2%

693 Process order

- Sodales At Veit Inc. 134 9%
- Mus Institute 75 5%
- Lacus Foundation 26 2%
- Vestibulum Ut Eros Corp. 25 2%
- Augue Porttitor Limited 22 1%

30 END

- Sodales At Veit Inc. 7 0%
- Mattis Omare Lectus Inc. 5 0%
- Mus Institute 2 0%
- Vitae Industries 2 0%
- Enim Nec Tempus LLP 1 0%

13 Demand for information

- Mus Institute 5 0%
- Mattis Omare Lectus Inc. 2 0%
- Enim Nec Tempus LLP 1 0%
- Auctor Odio A LLC 1 0%
- Eget Odio Corporation 1 0%

Details

Approving on specific level

Frequency

- Total count 1 480
- Case count 723
- Max. repetitions 5
- First in case count 723
- Last in case count 30

Performance

- Total duration 2y 11M 2d 9h 5m
- Standard deviation 1d 21h 1m 28s 537ms
- Mean duration 17h 24m 22s 94ms
- Max. duration 25d 1h 45m
- Min. duration 0

Financial analysis

OrderTotalAmountWithoutVAT

- Total 755 076,18
- Standard deviation 3 086,00
- Mean 1 044,37
- Maximum 36 511,68
- Minimum 0,00

Select attribute to add

Top attributes

Resource

- Cullen Cameron 288 19%
- Kieran Gross 208 14%
- Edan Carrillo 195 13%
- Priscilla Gill 94 6%
- Saphne Cash 89 6%

Select attribute to add

Customize

Visualize

Variants

Fig. 12. Activity details panel with the advanced panel shown



03.2

Process Map

Detail panel / Path detail panel

The Path detail panel is shown in Figure 13. To the "Top attributes" list of this panel, you can only add attributes that were marked as case-level attributes during the process import. Use the filter button to go from this panel to the filters screen with a default sequence filter.

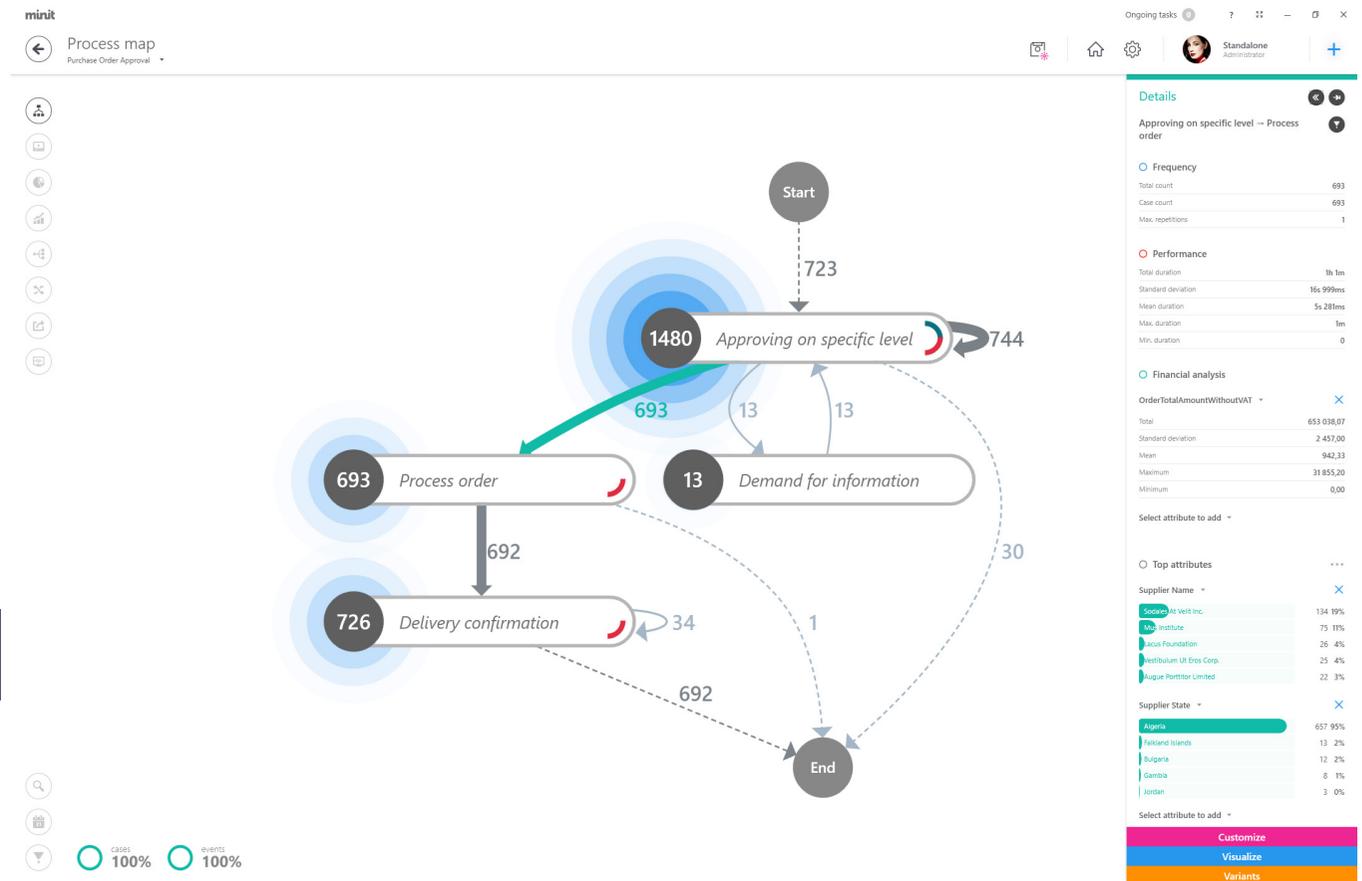


Fig. 13. Displayed details panel for the selected path



03.2

Process Map

The Advanced panel displays the start and end activities of the edge with the selected attribute and an optional number of attribute values. On this panel, you can view any attribute imported with the process.

Advanced details

Approving on specific level → Process order

Resource ▾ ...

693 Approving on specific level

Edan Camino	178	26%
Cullen Cameron	134	19%
Tim Day	78	11%
Priyella Gili	72	10%
Rene Wilder	55	8%

693 Process order

Kieran Gross	197	28%
Thor Hensley	97	14%
Azalia Hansen	87	13%
Daphne Cash	66	10%
Wlona Roman	45	6%

Details

Approving on specific level → Process order

○ Frequency

Total count	693
Case count	693
Max. repetitions	1

○ Performance

Total duration	1h 1m
Standard deviation	16s 999ms
Mean duration	5s 281ms
Max. duration	1m
Min. duration	0

○ Financial analysis

OrderTotalAmountWithoutVAT ▾ ×

Total	653 038,07
Standard deviation	2 457,00
Mean	942,33
Maximum	31 855,20
Minimum	0,00

Select attribute to add ▾

○ Top attributes ...

Supplier Name ▾ ×

Sodales At Veilt Inc.	134	19%
Max Institute	75	11%
Lacus Foundation	26	4%
Vestibulum Ut Eros Corp.	25	4%
Augue Porttitor Limited	22	3%

Supplier State ▾ ×

Algeria	657	95%
Falkland Islands	13	2%
Bulgaria	12	2%
Gambia	8	1%
Jordan	3	0%

Select attribute to add ▾

Customize
Visualize
Variants

Fig. 14. Path details panel with the advanced panel shown



03.2

Process Map

Newsfeed panel

The Newsfeed panel shown in Figure 15 is designed for the collaboration of several users in the process analysis. If you work as an individual, you can use the panel for notes.

The Newsfeed panel can only be used in a view created from the process. You can add comments with a snapshot to the panel.

The “Snapshot” represents a link, and you can create it in each Process Explorer screen with any setting using the Comments icons in the top panel of the application. You can then click such link in the comments list and view the recorded screen with settings from which the snapshot was taken.

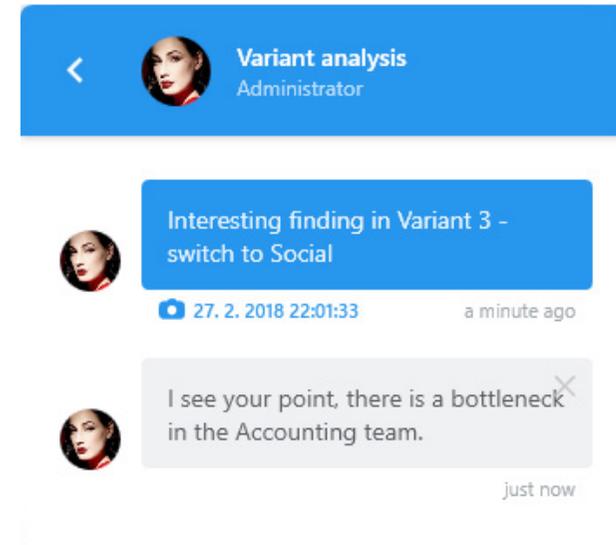


Fig. 15. Newsfeed panel



03.2

Process Map

Working hours

Working hours feature allows you to define calendar templates, which can be applied to process views in the Process explorer to influence the performance analysis calculation, which is by default performed on a 24/7 basis.

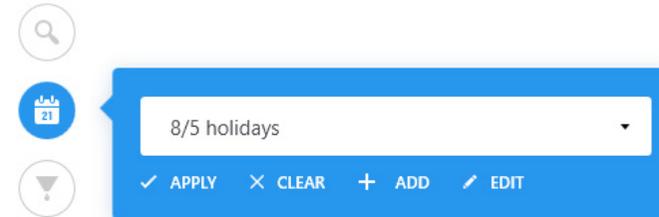


Fig. 16. Calendar emplate selection in the Process map

Try adding a new calendar template, defining your working week and non-working time (import your national holidays!) and Apply it to your performance analysis to observe the changes in the displayed activity and edge durations.

Calendar template

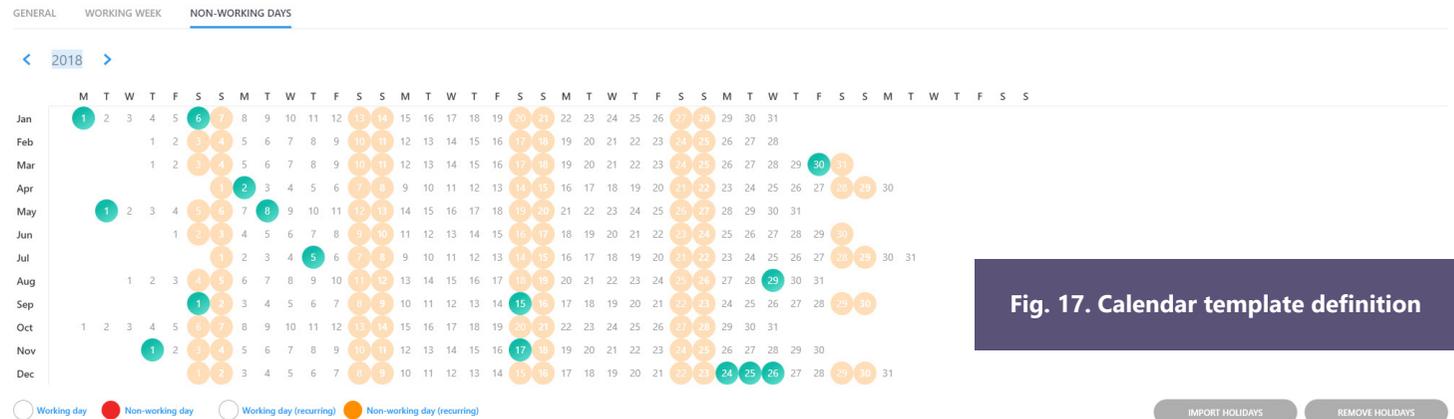


Fig. 17. Calendar template definition



03.3 Animation

An animation visualizes the progress of the process over time. The animation is always done over the displayed process map or social network. To adjust the level of detail of the process map and the social network or to view the details of activities and edges you can use all the panels available on the process map screen. When using the sliders to reduce the complexity or change the offset of process map activities you will need to pause the playback, make a change and then resume playing.

The animation playback control is located in the bottom part of the screen and you can use it to start the animation, to pause it or skip to any position in the process.

The information about the current time in the process is shown on the left. An animation screen is shown in Figure 18.

In addition to the process map, the animation screen also contains a panel to configure the animation. You can try the social network animation in the Purchase Order Approval process.

Set the animation panel controls as shown in Figure 18. During the animation, you can observe how resources pass the work in the process, which resource represents a potential bottleneck, or you can view in which period the global maximum of the level of the number of events carried out by resources in the process occurred.

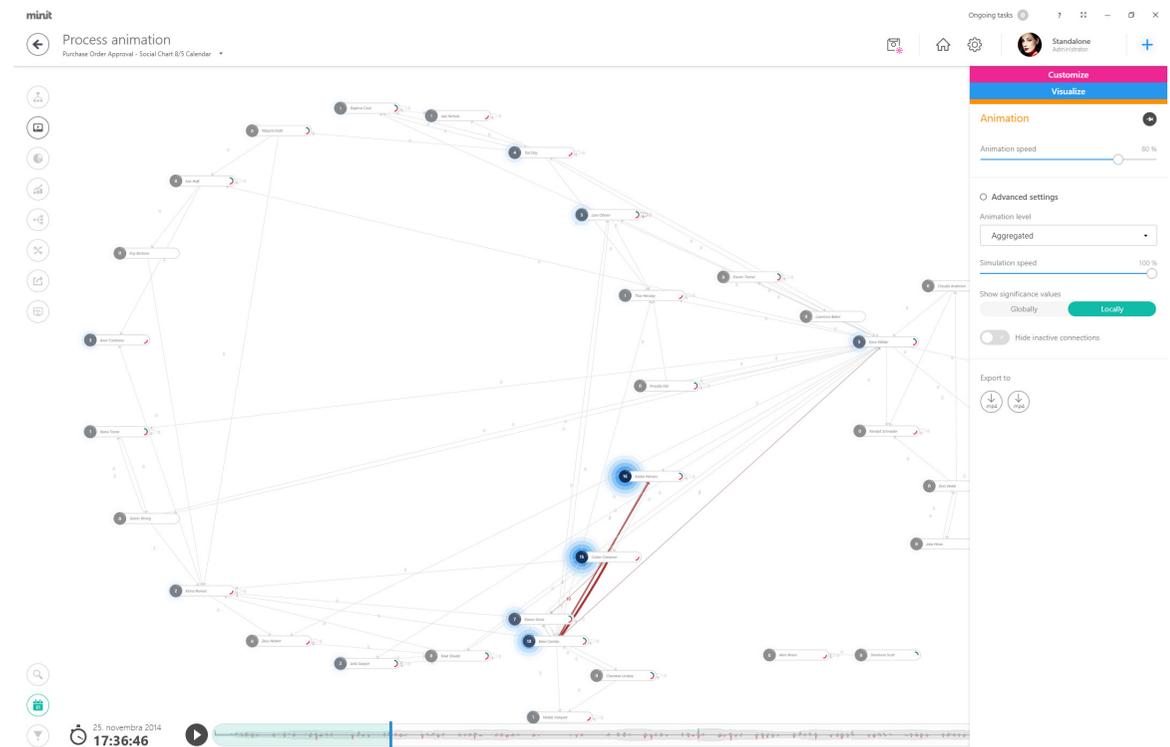


Fig. 18. Process animation window with the animation panel shown



03.3

Animation

Animation speed

Use the Animation speed to adjust the animation playback speed. The information displayed in the animation frame remains unchanged.

Simulation speed

You can use the Simulation speed slider to adjust the speed of the process simulation (in other words, frame rate), which serves as a basis for displaying information in the animation.

The change of the simulation speed essentially influences the degree of detail of the displayed process dynamics. Depending on the nature of the monitored process, its duration and the objective of the analysis, a higher or lower degree of detail of the dynamics may be suitable.

However, the usual rule is that if we have a long-lasting process and we need a detailed analysis of dynamics over a shorter period, it is suitable to use a filter to restrict the process under analysis only to the period in question.

Hide inactive paths

This setting can be used to hide the connections that are not presently active to make the animation less cluttered.

Animation level

By setting the animation level, you can change the meaning of the dynamics of the process playback.

Animation level / Instant animation level

If you set the animation level to Instant, the current dynamics in the process will be displayed during the playback.

The number on the activity corresponds to the number of currently ongoing events of the given activity. The number at the edge corresponds to the number of currently ongoing passes of events between the activities of the given edge.



03.3

Animation

Animation level / Aggregated animation level

Setting the animation level to Aggregated means that, during playback, the process dynamics aggregated in the time period around the currently monitored time point will be shown. The determination of the length of the time period used to aggregate the information for the current view is a part of mining in the process, and it depends on the duration of the process and the simulation speed setting (the higher simulation speed, the longer the time period is aggregated). The number on the activity and the edge corresponds to the number of events, which are currently taking place, were taking place, or will take place in the monitored aggregated period.

Exporting animation

The process animation can be exported as a video in mp4 format. You can choose to export the entire animation or only a specified time period. All of the animation settings on the Animation panel will be transferred to the exported video.

Displaying the significance of values

The value significance display switch can be used to set the mode with the colour highlighting of edges and nodes in the animation.

Globally

With this setting, the current value will be highlighted in colour in charts edges and nodes with regards to all the values of all nodes and edges in the entire animated process. Thus, the thickest edge or the most highlighted node represents the global maximum for the whole duration of the process.

Locally

With this setting, the current value will be highlighted in colour in the charts edges and nodes with regards to the current values of all the nodes and edges in the animated process. Thus, the thickest edge or the most highlighted node represents the local maximum in the current time.



03.4 Charts

You can use charts to track the distribution of values or to examine the dependencies of attributes and process metrics. We recommend for you to use the charts functionality to determine the particular information, usually when you already have a more detailed idea about the process.

The chart screen is shown in Figure 19. The Customize panel allows you to configure what the chart will look like and what information will be displayed. To save the chart, hide the legend, or export it in ".png" format, use the Chart Management panel.

After you configure the chart, open the configuration, or change anything in the chart configuration, it is necessary to click Show chart at the bottom of the Customize toolbar.

You can try using the carts in the Invoice Approval process. In this process, we are interested in how long process instances for individual suppliers last on average. Set the customise panel controls as shown in Figure 19. In the chart, you can see differences in the average duration of the invoice approval for each supplier. These differences may be caused by various factors, and their identification may be subject of further analysis.

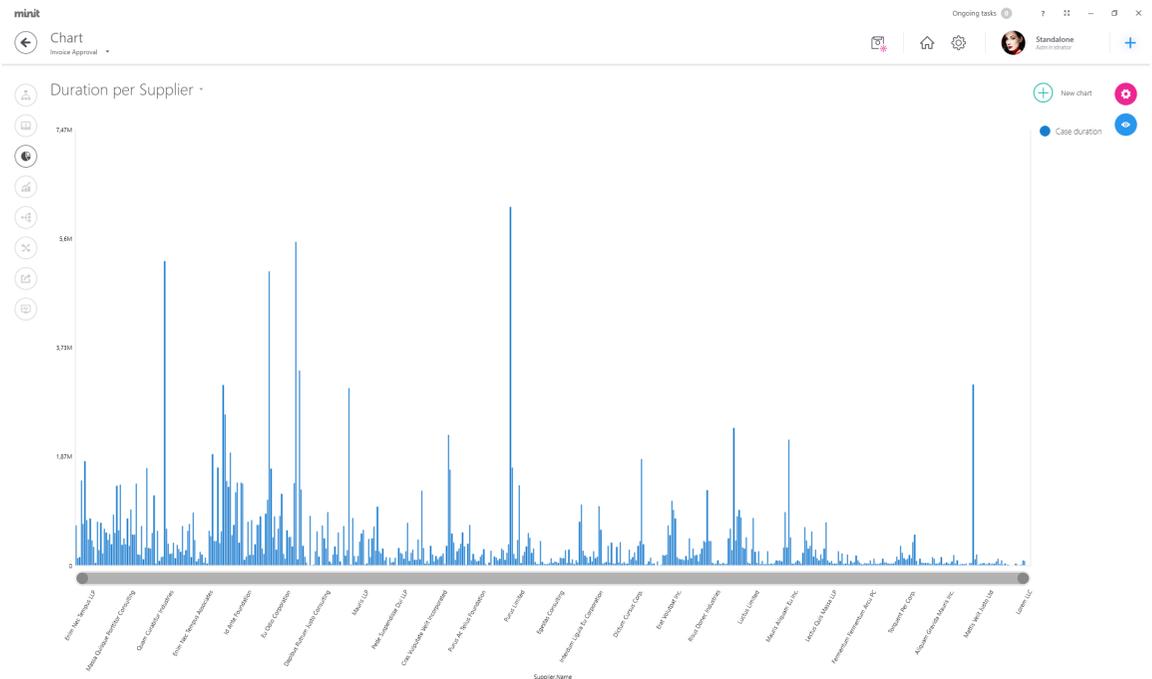


Fig. 19. Charts window with the customize panel shown



03.5

Statistics

A process analysis requires accurate numbers and detailed information. All of this can be found on the Statistics screen. Here, you can find a detailed overview of the properties of the analysed process in the form of summary charts and statistics. You can also find a statistical overview of the individual attributes of the process selected when importing the log. The statistics screen is shown in Figure 20 with the Case overview displayed. Summary charts and the statistics of the

predefined process metrics are shown in the upper part. The bottom part of the screen includes tables with overviews of specific records displayed in the statistics. Individual summary charts of statistics can be exported as an image in “.png” format; a table overview can be exported as a “.csv” file.

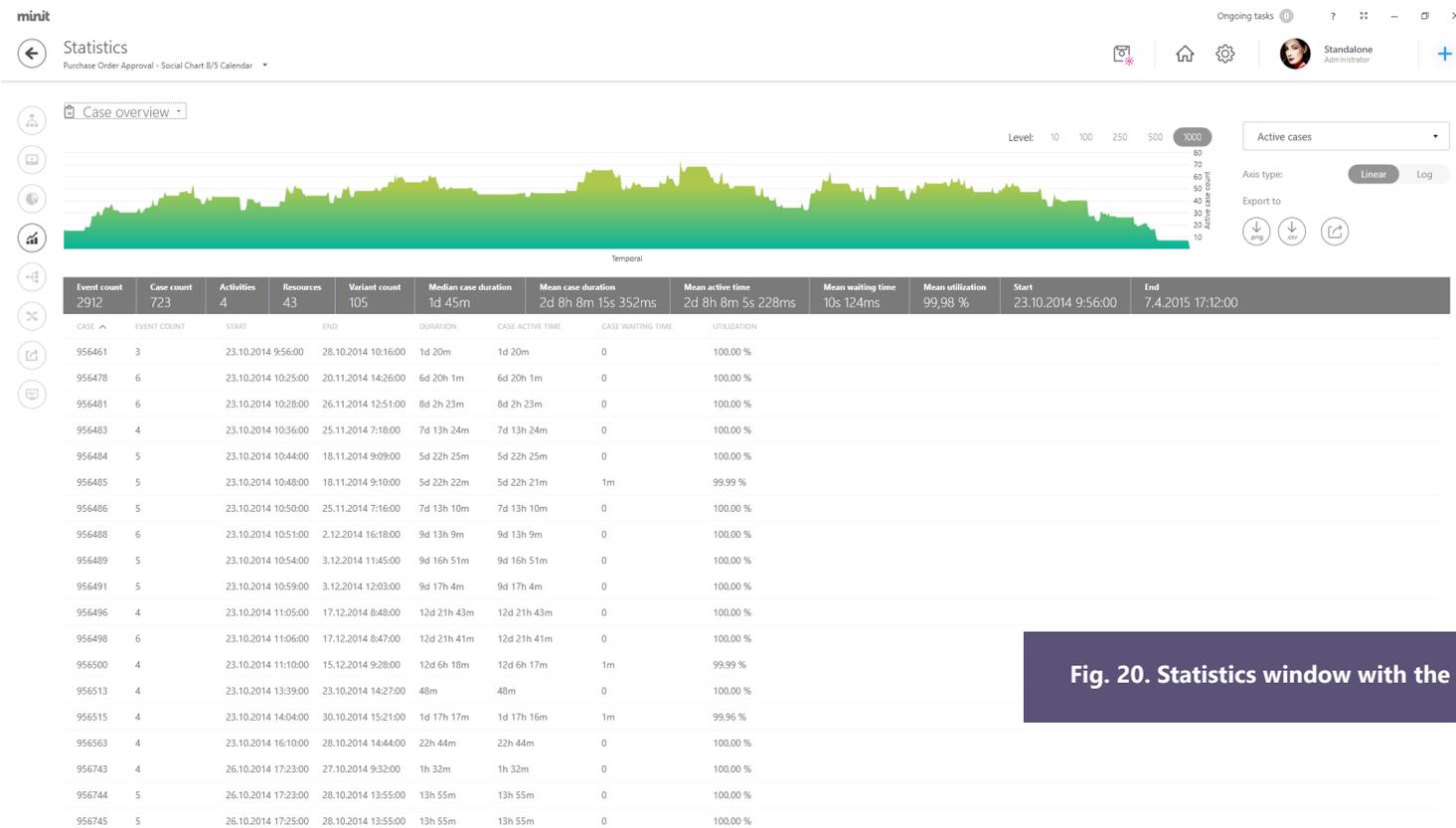


Fig. 20. Statistics window with the Invoice Approval process characteristics shown



03.5

Statistics

The statistics of data are always recalculated after applying the filters. You can filter selected values in the summary charts in the statistics of process instances and the statistics of attributes by selecting each column. An example of such filtering is shown in Figure 21. It is there that we marked two resources with the highest number of cases in which they participate (metric Case frequency). When you make a selection, the filter screen will automatically appear with the preset values of the filter attributes.

Case overview

These statistics refer to cases in the process undergoing analysis and show their quantities in comparison with various process parameters. You can examine the process load in time, the quantity of variants, distribution of the number of events in the process instances, and many others. A complete list with a detailed explanation can be found in the application user's guide/help. In the table, with a detailed list of procedural instances, you can double-click the selected instance to go directly to the detail of its events on the Variant screen.

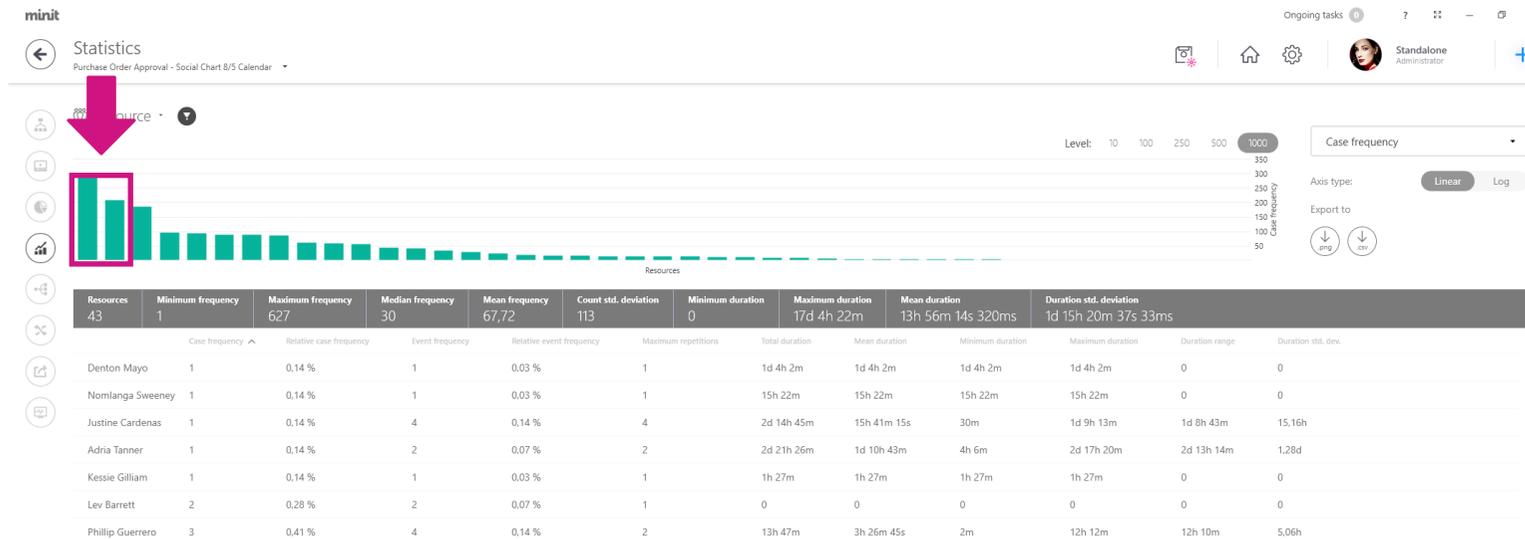


Fig. 21. Drag and drop filtering option in Statistics window



03.5

Statistics

Attributes statistics

These statistics refer to the activities and attributes in the process undergoing analysis, and their properties are shown. If the imported process also includes resources, here you can explore their characteristics. The same statistics are calculated for each imported attribute. You can use the quick filter shown in Figure 22 as part of the statistics for the attributes. The filter allows you to filter out statistics of process attributes by selected value or by a set of values of the selected

attribute. As an example, we present the situation in the Purchase order approval process, where we want to verify, which resources are dealing with the Delivery confirmation activity. You can see the filter setting in Figure 22, where we chose a quick filter according to the "Activity" attribute for the "Resource" attribute. In the list, we can see all the available activities. After applying the quick filter, the values of other metrics were recalculated automatically as well.

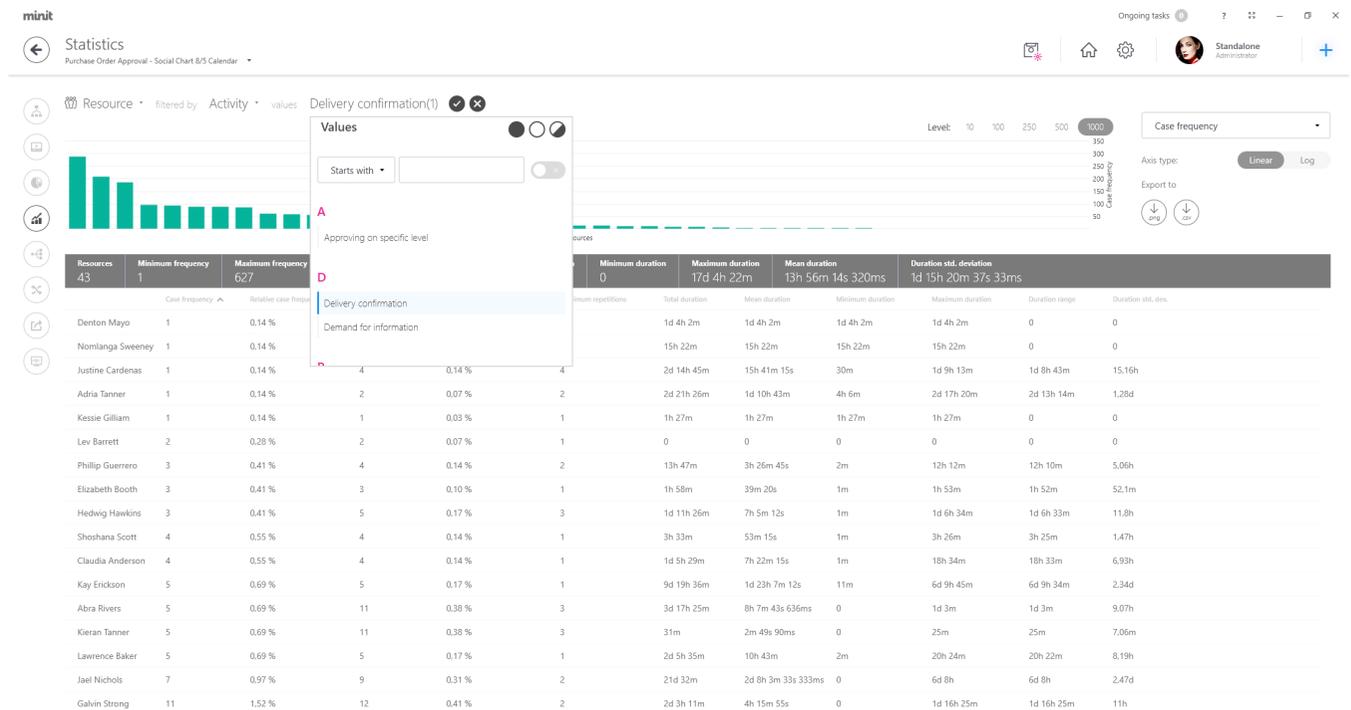


Fig. 22. Event filter in the Attribute statistics window



03.5 Statistics

Influencer

Influencer is a simple, yet powerful and explanatory metric calculated for all case-level attributes in your data.

Influencer calculates the impact, a certain case-level attribute value has on the process performance weighted by the importance of this attribute value in the process context. In other words, the more often the attribute value occurs the more impact it causes.

Displayed in percentage, negative values (green) boosting performance, positive (red) slowing the process down.

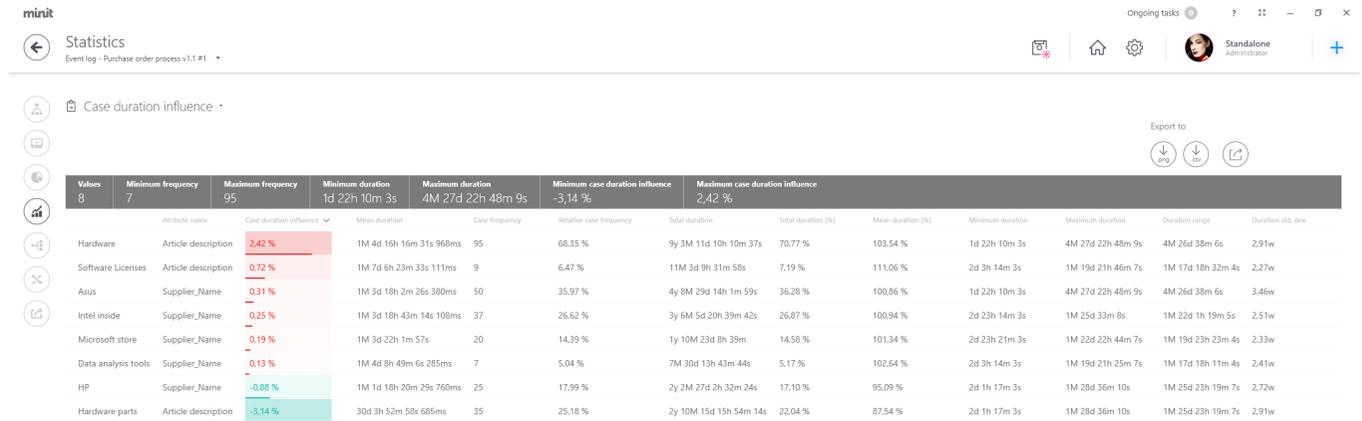


Fig. 23. Event filter in the Attribute statistics window



03.6 Variants

While a process map shows the process flow at a higher level of abstraction, the Variants screen provides a deeper insight into the process instances and allows you to view individual events in detail. Such a view of process instances is very important in the process analysis because it enables you to identify the particular cases that meet a specified condition. As an example, we can see a situation when, after applying a filter, we will determine the unauthorised or unusual behaviour in the process map. Then, you can view filtered out process instances and their respective

events and their attributes providing additional information (such as the invoice type) to determine the causes of this behaviour. In a similar procedure, we can find and allocate a set of process instances in which deviations from the standard procedure were recorded, or important business rules were violated. The Variant screen is shown in Figure 24 with the Variant overview displayed. In addition to this view, the screen also contains an overview of the process instance events in the Cases table and a view of the progress of the process instance in a Gantt diagram.

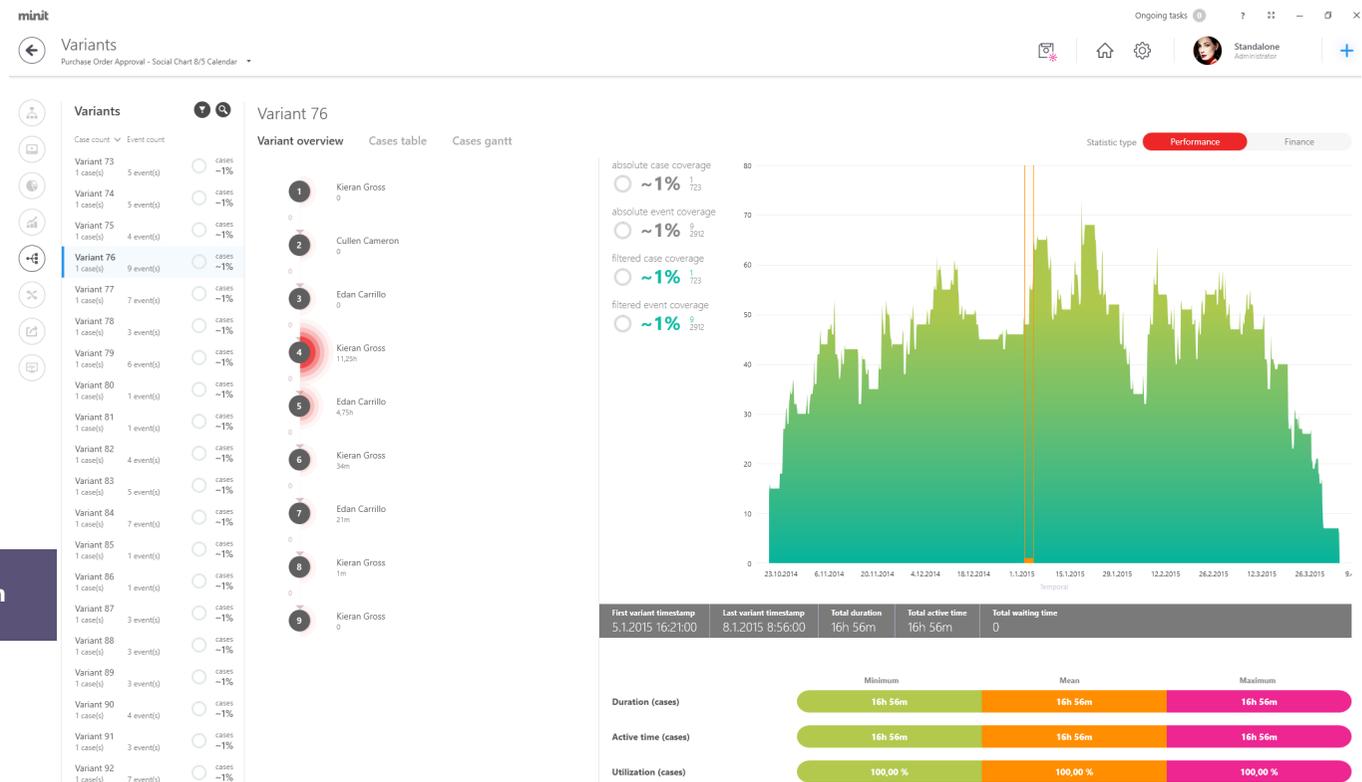


Fig. 24. Variant window with the Variant overview shown



03.6

Variants

Cases table

This view allows you to view various process instances along with the details of recorded events. After selecting the specific variant, a list of process instances that belong to the given variant will be shown.

Cases Gantt

This visualization displays a list of events as a Gantt diagram. Through this diagram, it is possible to easily and quickly identify long-lasting events, parallel events or to identify events with the longest waiting time between them.



03.7 Filters

To achieve the stated objectives of the process mining project, it will be necessary to adjust the dataset. There may be situations when the dataset will contain data that do not fit into the concept of your analysis. For example, the dataset may include process instances from the testing stage of the process. This or a similar situation can be solved in two ways. The first method constitutes a modification of the dataset during its extraction from the source. The second and much more straightforward way is to modify the dataset using filtering capabilities offered in Minit.

A filter is a rule or a set of rules determining which cases and/or events from the process will be later included in the process analysis. Filters are applied to the entire cases in case of case-level filters or they can modify cases by including/excluding events in case of event-level filters.

The filter screen is shown in Figure 25. The left part of the screen includes a list of currently used filters, while the detail of the filter is displayed on the right. Filters are applied in the order in which they are defined in the list of filters (event-level applied before case-level filters).

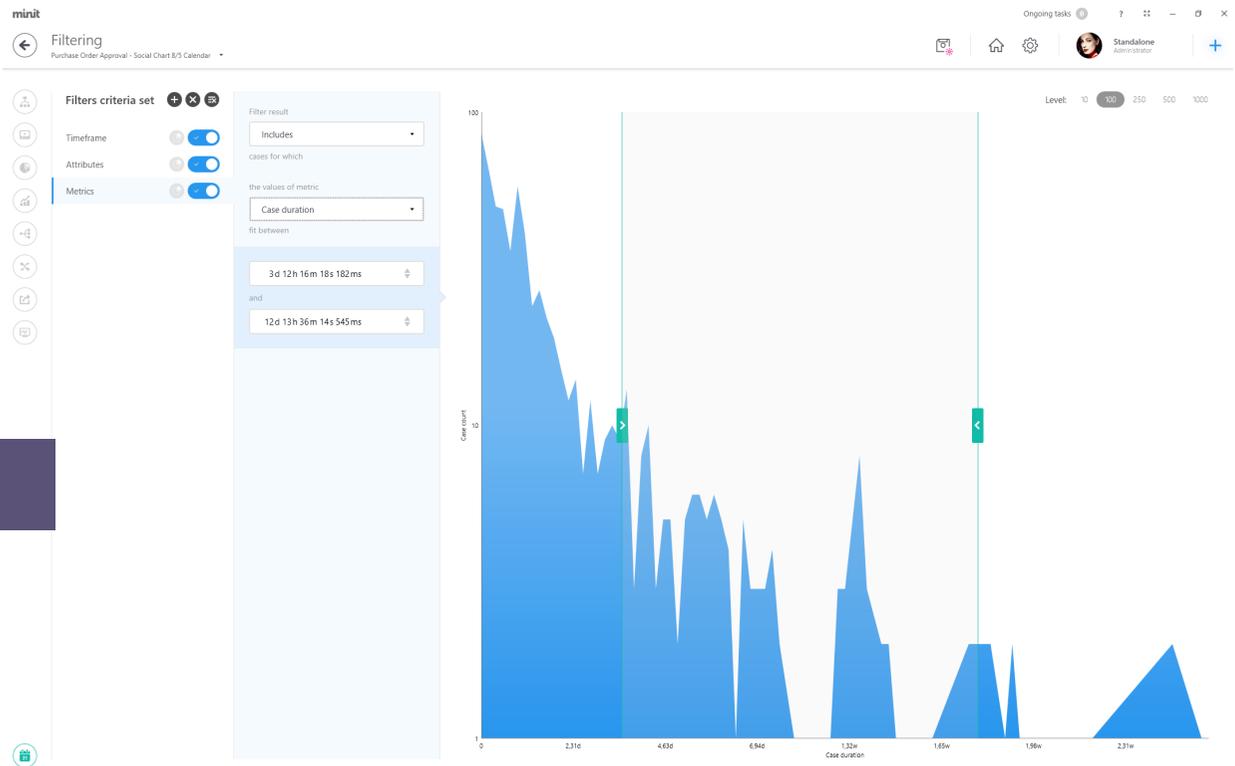


Fig. 25. Filter window with displayed Metrics – Case duration filter



03.7

Filters

The overall result of the filtering is cases and/or events that match all the active filters in the given order. If necessary, the same filter type can be used multiple times (such as a filter for attributes). However, for some filters, their multiple uses do not make sense, or it could lead to an empty result set (such as combining several variant or timeframe filters).

We are interested in long-lasting process instances in the Invoice Approval process. We will set the range of duration values as in Figure 25. We can set the required duration directly in the values layout chart or by filling textboxes. In the bottom left corner, we see indicators from which we can read the current volume of data with which we will work after applying the filter.

As an example of event-level filter, we can try setting a Subprocess filter for the part of process starting with activity "Status changed to Approved" and ending with activity "Status changed to Accounted"

As an example of using filters, we will use the Metrics filter type and the "Case duration" metric. We are interested in long-lasting process instances in the Invoice Approval process. We will set the range of duration values as in Figure 25. We can set the required duration directly in the values layout chart or by filling textboxes. In the bottom left corner, we see indicators from which we can read the current volume of data with which we will work after applying the filter.



03.7

Filters

Case-level filters:

Timeframe

Use this filter to select the timeframe for the analysis.

Attribute

Use this filter to select only those cases which contain/do not contain any particular attribute. For example, cases in which a particular activity is carried out or cases with a specific resource.

Attribute (conditional)

This filter enhances the Attribute filter with additional criteria based on other attribute or metrics. E.g. you still want to find all cases where activity Approval occurs, but only those where this Approval was executed by a specific resource or the duration of this Approval exceeds a certain KPI.

Variant

Use this filter to restrict the mining in the process only to the cases following a certain scenario (variant).

Metrics

Use this filter to filter the cases by various metrics. After you select the metrics, a dependency chart for that metric will be displayed.

Sequence

This filter applies to the sequence in which events are performed in a case. You can use it to define the sequence in which two events with specific attribute values are performed and to specify further requirements for the progress of events in a process instance.

Endpoint

Use this filter to restrict cases according to the property of the event that occurred at the beginning or at the end of the process instance.

Conflict of interests

Use this filter to detect process instances with a conflict of interests. A typical example is the violation of rules of roles division in performing critical tasks. Using this filter, you can specify two sets of events, for which we want/do not want to have the same value of any attribute.



03.7

Filters

Event-level filters:

■ Attribute

Use this filter to select only those events in all cases which contain/do not contain any particular attribute value(s). For example, only events executed by certain resources.

■ Subprocess

Use this filter to „cut“ out a part of the process from all cases (where the criteria for subprocess do not apply, case is completely excluded). For example in a purchase order approval process we want to focus on the part from purchase order creation until the purchase order is marked as approved or in a service center ticket solving process we want to see only the part being dealt by the second level support department.



03.8

Process compare

The "Process compare" is another essential functionality of Minit. This functionality allows an intuitive and efficient comparison of processes. You can compare the processes at the process map level, where the generated visualization allows you to identify differences in the flow or at the activities and edges level using the Detail panel. The process map elements detail panel numerically

and graphically displays the differences in frequency, performance and finance metrics, but also numerical differences in attribute values. The Process compare allows you to compare various processes or different views generated from a single process (e.g. for different periods of time). It is important to remember that you can compare only saved views.



Fig. 26. Process compare window



03.8

Process compare

We will demonstrate the use of this functionality on a comparison of two views of the Invoice Approval process. We will look at what the differences are in processing invoices from suppliers from different countries. For this purpose, we used the Attribute filter on the "Supplier.State" attribute. One view was created for the "Falkland Islands" value and the second for the "Denmark value"; both views were saved using the "Manage view" at the top bar. For comparison, we will display the view on suppliers from the Falkland Islands, select the Invoice Approval process in the bottom right corner and add the Denmark view.

The comparison result is shown in Figure 26. The differences can be observed not only in the colour variations of activities and edges but also on the frequency, performance or finance metrics displayed on them. For example, you may notice that the "Demand for Information" activity or the edge between the "Compare of Sums" and "Status change to Approved" activities is carried out only for the "Falkland Islands" suppliers. Furthermore, you can examine the detail of activities or edges for the identification of the resources that manually map or approve orders. You can also explore the differences in frequency, performance and finance metrics in detail of activities and edges. The bottom part of the screen also includes a control panel to display the compared view separately.



03.9 Export

In addition to exporting findings in the form of visualisations and tabular overviews, Minit also allows exporting the analysed dataset and specific information obtained from data using the process mining technology. If you need to process a dataset in a different way during the analysis, you can use the export of events in several formats. When exporting the dataset, you can include the applied filters. A specific export offered by Minit is the export of process instances with infor-

mation obtained in the data-processing. This export allows you to expand your process mining project using additional technologies, such as Business Intelligence, Data mining, or Machine learning.

An example of the exporting process instances is shown in Figure 27. This type of export allows you to select which attributes and metrics will be included in the output file.

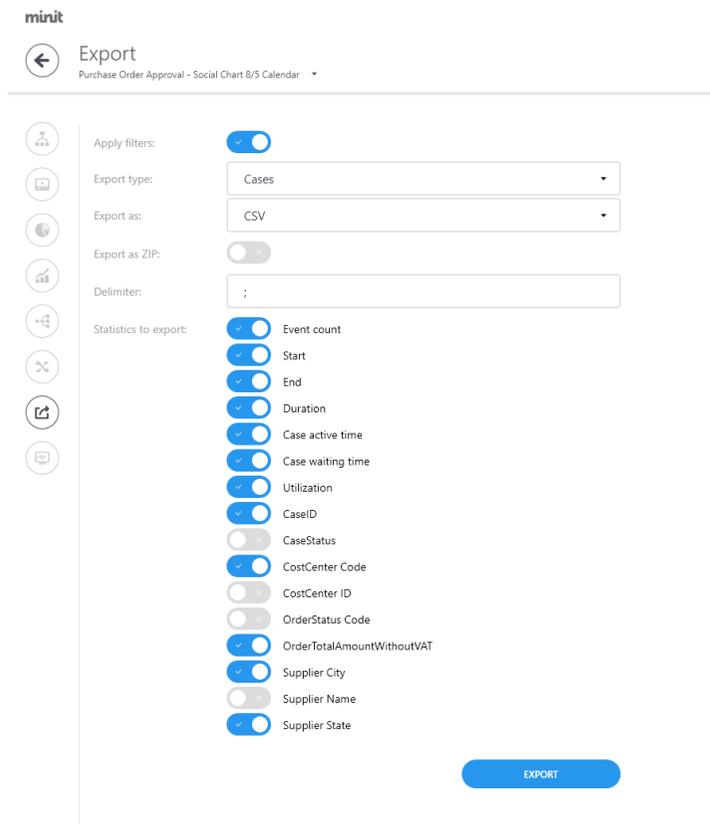


Fig. 27. Export window with the export configuration shown



03.9

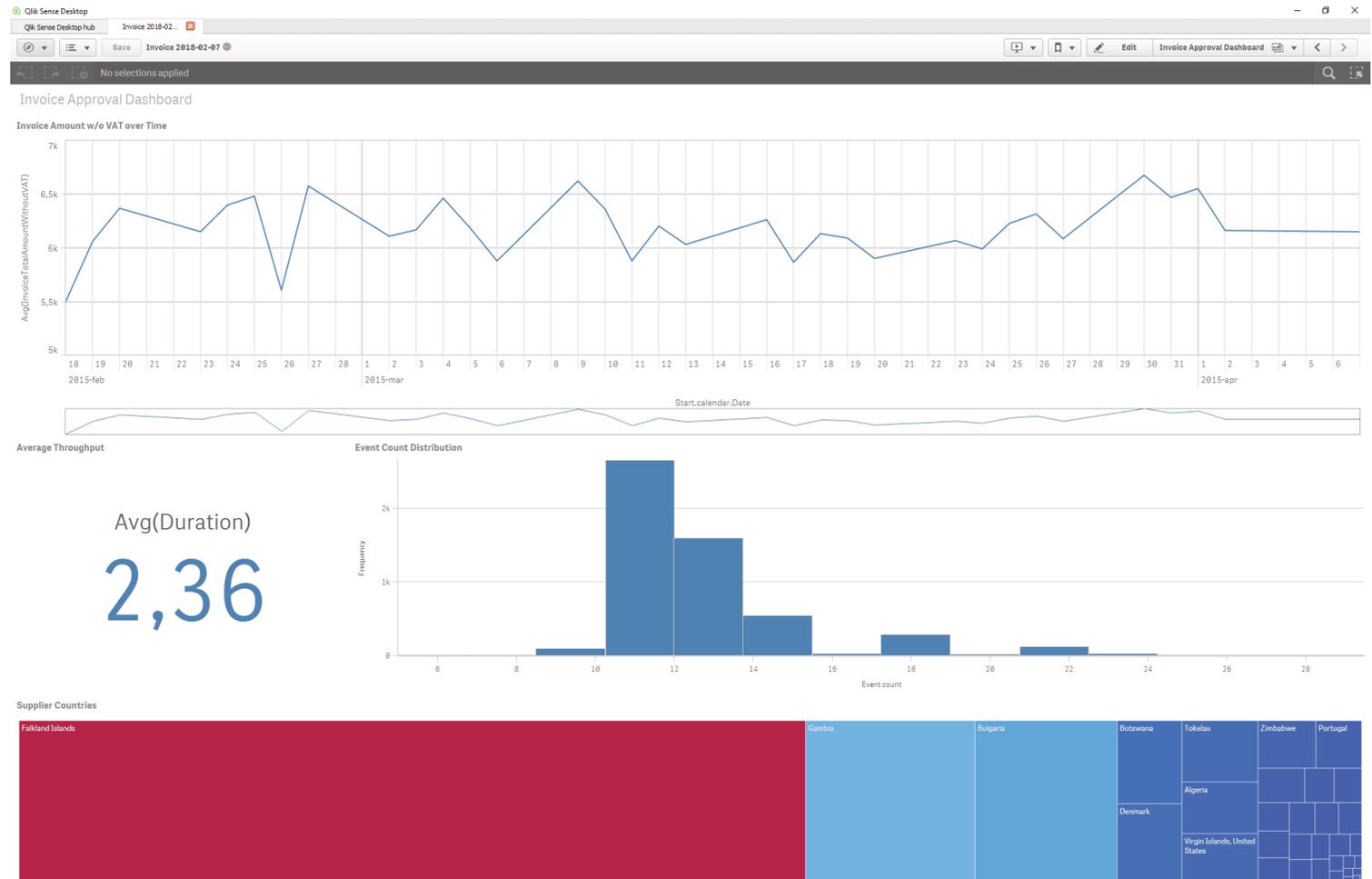
Export

Integration with Qlik Sense

Minit natively integrates with Qlik Sense and thus enables you to extend the analysis via interactive dashboards. Use the Export functionality on Case or Event level with Qlik option – a Qlik application is automatically created and data is loaded into it. Just create a New Sheet and drag and drop your visualizations on the canvas.

Qlik Sense must be installed to use this feature.

For integration with other BI tools such as Microsoft Power BI or Tableau, please use the CSV export.



Avg(Duration)
2,36

Fig. 28. Example of a Qlik Sense Dashboard on Minit Data

Try it with your own data

Now it is time to let you fly. Try your own analysis, with your own data (or have a look here <http://www.process-mining.org/logs/start> if you need some real life examples).



04.1

Import process

Minit supports the following types of datasources:

- File**
 Supported are CSV, XES, MXML, Microsoft Excel and Microsoft Access file formats, even compressed in ZIP
- SQL Server**
 native connectivity to Microsoft SQL Server, data can be extracted from a table, view, using a stored procedure or using custom query
- ODBC Driver**
 Using any third party ODBC driver configured to access the source of data

You can define a new one or re-use one of the recent import configurations. Data validation will help you to investigate event log issues that might affect your analytical results.

CASID	ACTIVITY	STARTTIMESTAMP	ENDTIMESTAMP	EVENTTYPE	ACTIVITYSTATUS	EVENTSTATUS	RESOURCE	ACTIVITYFINALACTION	CASESTATUS	COSTCENTER.CODE	COSTC
956461	Approving on specific level	2014-10-23T09:56:24	2014-10-23T09:58:38	2	Completed	Completed	Lara Obrien	Approved	Completed	CostCenter1	35
956461	Process order	2014-10-23T09:58:42	2014-10-23T10:04:12	2	Completed	Completed	Lara Obrien	OrderProcessed	Completed	CostCenter1	35
956461	Delivery confirmation	2014-10-23T10:04:21	2014-10-28T10:16:36	2	Completed	Completed	Lara Obrien	DeliveredCompletely	Completed	CostCenter1	35
956478	Approving on specific level	2014-10-23T10:25:27	2014-10-23T11:11:30	2	Completed	Completed	Azalia Hansen	Approved	Completed	CostCenter2	37
956478	Approving on specific level	2014-10-23T11:11:32	2014-10-23T13:16:32	2	Completed	Completed	Cullen Cameron	Approved	Completed	CostCenter2	37
956478	Approving on specific level	2014-10-23T13:16:40	2014-10-23T13:24:47	2	Completed	Completed	Edan Carrillo	Approved	Completed	CostCenter2	37
956478	Process order	2014-10-23T13:24:51	2014-10-23T13:57:54	2	Completed	Completed	Azalia Hansen	OrderProcessed	Completed	CostCenter2	37
956478	Delivery confirmation	2014-10-23T13:57:56	2014-11-11T13:01:57	2	Completed	Completed	Azalia Hansen	DeliveredPartially	Completed	CostCenter2	37
956478	Delivery confirmation	2014-11-11T13:01:58	2014-11-20T14:26:17	2	Completed	Completed	Azalia Hansen	DeliveredCompletely	Completed	CostCenter2	37
956481	Approving on specific level	2014-10-23T10:28:38	2014-10-23T11:12:28	2	Completed	Completed	Azalia Hansen	Approved	Completed	CostCenter2	37
956481	Approving on specific level	2014-10-23T11:12:30	2014-10-23T13:17:24	2	Completed	Completed	Cullen Cameron	Approved	Completed	CostCenter2	37
956481	Approving on specific level	2014-10-23T13:17:27	2014-10-23T13:25:22	2	Completed	Completed	Edan Carrillo	Approved	Completed	CostCenter2	37
956481	Process order	2014-10-23T13:25:26	2014-10-23T13:58:26	2	Completed	Completed	Azalia Hansen	OrderProcessed	Completed	CostCenter2	37
956481	Delivery confirmation	2014-10-23T13:58:28	2014-11-11T13:03:39	2	Completed	Completed	Azalia Hansen	DeliveredPartially	Completed	CostCenter2	37
956481	Delivery confirmation	2014-11-11T13:03:40	2014-11-26T12:51:30	2	Completed	Completed	Azalia Hansen	DeliveredCompletely	Completed	CostCenter2	37
956483	Approving on specific level	2014-10-23T10:36:27	2014-10-23T11:13:19	2	Completed	Completed	Azalia Hansen	Approved	Completed	CostCenter2	37
956483	Approving on specific level	2014-10-23T11:13:21	2014-10-23T13:18:39	2	Completed	Completed	Cullen Cameron	Approved	Completed	CostCenter2	37
956483	Process order	2014-10-23T13:18:43	2014-10-23T13:54:44	2	Completed	Completed	Azalia Hansen	OrderProcessed	Completed	CostCenter2	37
956483	Delivery confirmation	2014-10-23T13:54:46	2014-11-25T07:18:07	2	Completed	Completed	Azalia Hansen	DeliveredCompletely	Completed	CostCenter2	37
956484	Approving on specific level	2014-10-23T10:44:54	2014-10-23T11:14:47	2	Completed	Completed	Azalia Hansen	Approved	Completed	CostCenter2	37
956484	Approving on specific level	2014-10-23T11:14:49	2014-10-23T13:19:18	2	Completed	Completed	Cullen Cameron	Approved	Completed	CostCenter2	37
956484	Approving on specific level	2014-10-23T13:19:21	2014-10-23T13:25:48	2	Completed	Completed	Edan Carrillo	Approved	Completed	CostCenter2	37
956484	Process order	2014-10-23T13:25:51	2014-10-23T13:59:06	2	Completed	Completed	Azalia Hansen	OrderProcessed	Completed	CostCenter2	37
956484	Delivery confirmation	2014-10-23T13:59:08	2014-11-18T09:09:01	2	Completed	Completed	Azalia Hansen	DeliveredCompletely	Completed	CostCenter2	37
956485	Approving on specific level	2014-10-23T10:48:30	2014-10-23T11:15:35	2	Completed	Completed	Azalia Hansen	Approved	Completed	CostCenter2	37

Fig. 29. Process Import Wizard
Attribute type selection with data validation

Supported attribute types

Case ID		Case identifier
Activity		Activity
Event start		Event start time
Event end		Event end time
Event duration		Event duration
Resource		Human or system resource performing the activity

Supported attribute types

Finance		<p>Finance attribute</p> <ul style="list-style-type: none"> • Per Case Financial attribute having the same value for all events in the case, e.g. Invoice Amount without VAT • Per Activity Fixed cost/revenue/numeric value that changes per activity performed, e.g. costs for courier service • Per Resource Defined as a Man-Hour rate of a particular resource performing the event. The final cost/revenue/value is calculated using the defined per resource rate and time spent performing the activity, i.e. difference between the Event start and Event end timestamp values
Other		<p>Other attribute</p> <ul style="list-style-type: none"> • Case level attribute Having the same value for all events in the case, e.g. Supplier name • Event level attribute Having different values per event, e.g. Department performing the activity



04.2

Data refresh

Process intelligence is an iterative process

Data Refresh functionality and Process cloning is giving you the opportunity to use the import configuration of your process and reuse it to refresh the underlying data. The difference between the two is mainly in the usage scenario coming from the essence of data changes performed in the data source.

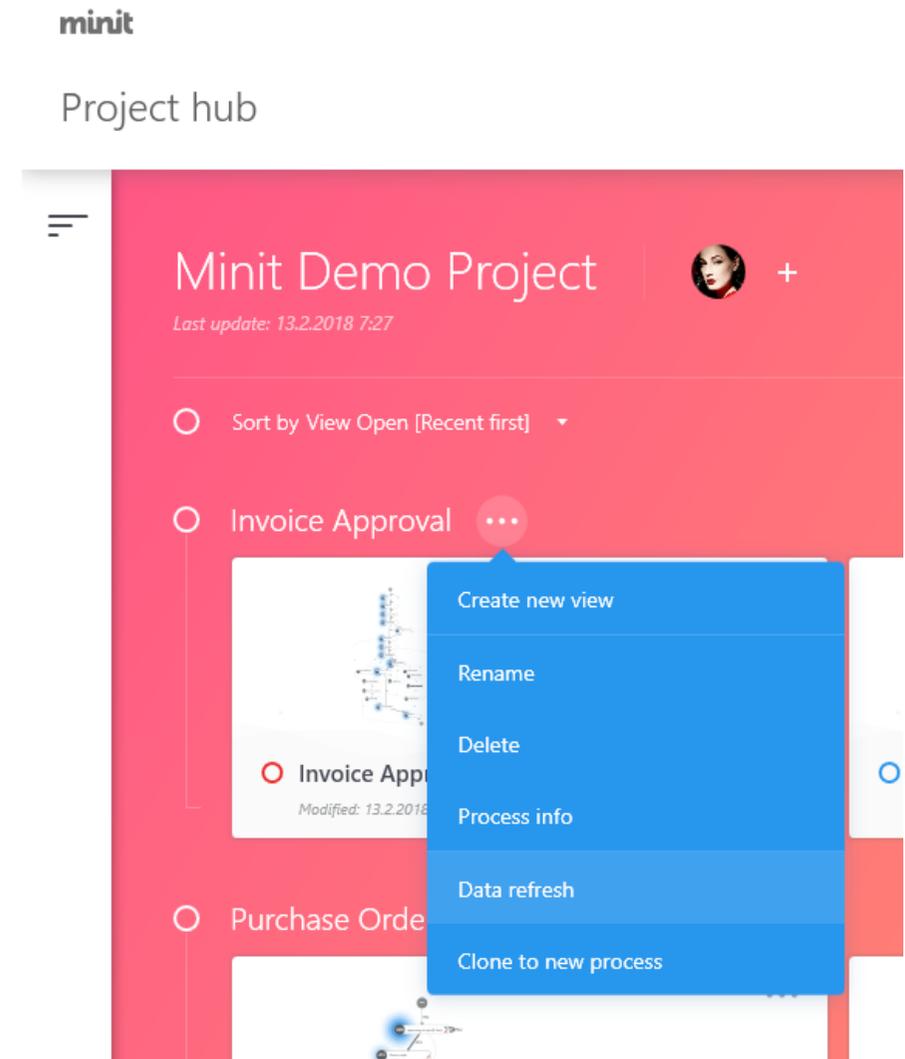
- **Data Refresh**

Is mostly used when you receive data similar to the original dataset, or new data has been added to the dataset. In this case, your process including all the views will be updated with new data, applied filters will be reevaluated and if anything is not consistent (e.g. the filtered variant no longer exists) we will tell you.

- **Clone to new process**

Is mostly used when new dataset is received but you would like to compare it to the original one (e.g. you had imported data for 2016 and you recently received export of 2017; you made changes to your process and want to evaluate the impact). In this case, the configuration is used to import the new dataset, allowing you to use the state-of-art process comparison functionality.

Fig. 30. Data Refresh and Clone to new process options available in the process context menu



Minit Quick Start Guide v 3.0

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