

Hands-on Session

Let's get started!



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Step 1 - Inspect Data

Open **PurchasingExample.csv** file in python/pandas (or Excel) and inspect its contents

- Every row corresponds to one event
- You find information on Case IDs, Activities, Start and end times, Resources, Roles

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Step 2 - Import Data

Load **PurchasingExample.csv** in Disco

Assign columns as follows:

- Case ID → Case ID
- Start and Complete Timestamp → Timestamp
- Activity → Activity
- Resource → Resource
- Role → Other

Click 'Start import'

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Case ID	Start Timestamp	Complete Timestamp	Activity	Resource	Role
1	2011/01/01 00:00:00.000	2011/01/01 00:37:00.000	Create Purchase Requisition	Kim Passa	Requester
2	2011/01/01 00:16:00.000	2011/01/01 00:29:00.000	Create Purchase Requisition	Immanuel Kangamant	Requester
3	2011/01/01 00:23:00.000	2011/01/01 03:35:00.000	Create Purchase Requisition	Kim Passa	Requester
4	2011/01/01 00:37:00.000	2011/01/01 00:43:00.000	Create Request for Quotation	Kim Passa	Requester
5	2011/01/01 06:41:00.000	2011/01/01 06:55:00.000	Analyze Request for Quotation	Karel de Groot	Purchasing Agent
6	2011/01/01 06:56:00.000	2011/01/01 06:56:00.000	Create Purchase Requisition	Alberto Dupont	Requester
7	2011/01/01 06:38:00.000	2011/01/01 09:00:00.000	Create Purchase Requisition	Fjodor Kowalski	Requester
8	2011/01/01 06:34:00.000	2011/01/01 09:36:00.000	Analyze Request for Quotation	Karel de Groot	Purchasing Agent
9	2011/01/01 09:49:00.000	2011/01/01 10:35:00.000	Create Purchase Requisition	Esmeralda Lubiala	Requester
10	2011/01/01 10:16:00.000	2011/01/01 10:21:00.000	Amend Request for Quotation	Christiane Francoux	Purchasing Agent
11	2011/01/01 11:15:00.000	2011/01/01 11:48:00.000	Analyze Request for Quotation	Magdalena Prodnuta	Purchasing Agent
12	2011/01/01 11:20:00.000	2011/01/01 11:31:00.000	Create Purchase Requisition	Christiane Francoux	Requester
13	2011/01/01 11:43:00.000	2011/01/01 12:09:00.000	Send Request for Quotation to Supplier	Karel de Groot	Purchasing Agent
14	2011/01/01 12:32:00.000	2011/01/01 16:03:00.000	Create Quotation comparison Map	Magdalena Prodnuta	Purchasing Agent
15	2011/01/01 12:30:00.000	2011/01/01 12:39:00.000	Amend Request for Quotation	Esmeralda Lubiala	Requester
16	2011/01/01 13:28:00.000	2011/01/01 13:38:00.000	Analyze Request for Quotation	Karel de Groot	Purchasing Agent
17	2011/01/01 14:05:00.000	2011/01/01 15:00:00.000	Create Purchase Requisition	Esmeralda Lubiala	Requester
18	2011/01/01 14:27:00.000	2011/01/01 15:17:00.000	Create Purchase Requisition	Fjodor Kowalski	Requester
19	2011/01/01 15:18:00.000	2011/01/01 15:40:00.000	Send Request for Quotation to Supplier	Francisco de Peralta	Purchasing Agent
20	2011/01/01 15:35:00.000	2011/01/01 16:43:00.000	Create Quotation comparison Map	Karel de Groot	Purchasing Agent
21	2011/01/01 16:17:00.000	2011/01/01 16:34:00.000	Create Purchase Requisition	Tessia Lohes	Requester
22	2011/01/01 16:00:00.000	2011/01/01 16:01:00.000	Create Request for Quotation	Alberto Dupont	Requester
23	2011/01/01 17:32:00.000	2011/01/01 17:45:00.000	Create Request for Quotation	Alberto Dupont	Requester
24	2011/01/01 18:39:00.000	2011/01/01 18:55:00.000	Analyze Request for Quotation	Magdalena Prodnuta	Purchasing Agent
25	2011/01/01 18:45:00.000	2011/01/01 18:51:00.000	Analyze Purchase Requisition	Meina Praemah	Requester Manager
26	2011/01/01 18:54:00.000	2011/01/01 18:58:00.000	Create Request for Quotation	Heinz Gutschmidt	Requester Manager
27	2011/01/01 19:04:00.000	2011/01/01 19:27:00.000	Analyze Request for Quotation	Francisco de Peralta	Purchasing Agent
28	2011/01/01 19:47:00.000	2011/01/01 19:55:00.000	Amend Request for Quotation	Pierre Odenwalder	Requester
29	2011/01/01 19:48:00.000	2011/01/01 20:14:00.000	Amend Request for Quotation	Bruno Schuster	Requester

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Step 3 - Inspect Process

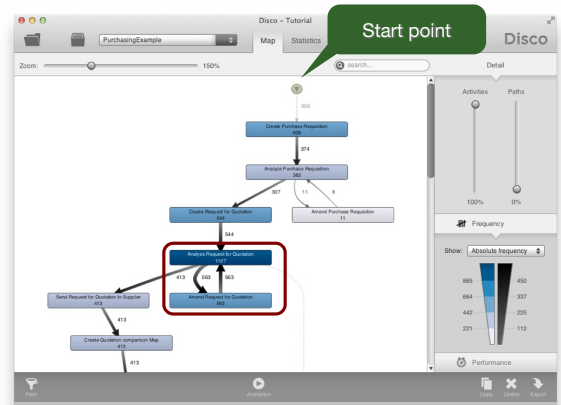
Look at the resulting process model

- Numbers in rectangles are activity frequencies
- Number at arcs is frequency of connection

→ You see the main process flows

- All 608 cases start with activity 'Create Purchase Requisition'
- Lots of changes were made (amendments)!

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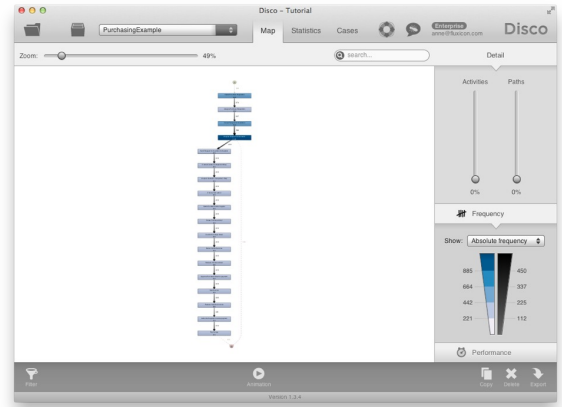
Step 3 - Inspect Process

It's important to be able to adjust the level of detail for the process map

Move up the 'Activities' slider down to lowest position (0%)

- Only the activities from the most frequent process variant are shown

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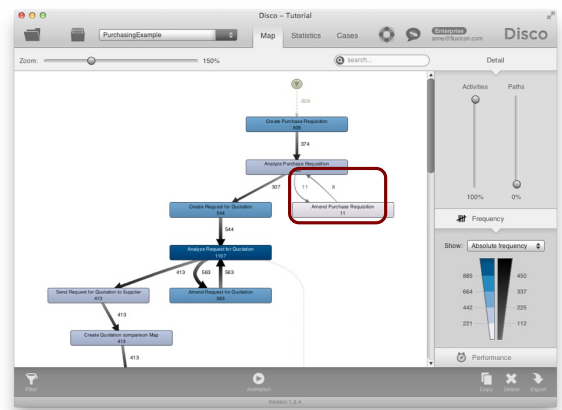
Step 3 - Inspect Process

Gradually move the 'Activities' slider up to 100% again until all activities are shown

- Even infrequent activities such as 'Amend Purchase Requisition' are shown

You'll notice that 11 cases are flowing in to 'Amend Purchase Requisition' but only 8 are moving out - Where are the other 3?

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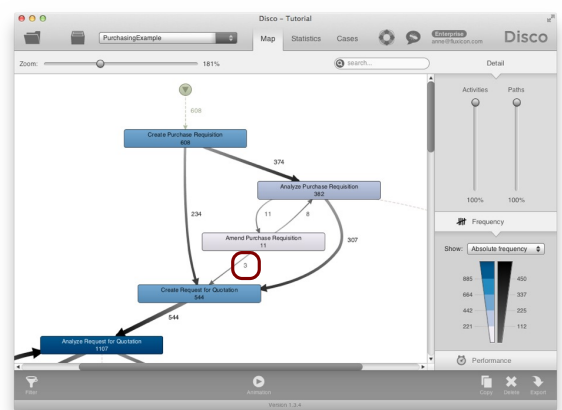
Step 3 - Inspect Process

Move up the 'Paths' slider up to the top

You now see a 100% detailed picture of the executed process

- The 3 missing cases move from 'Amend Purchase Requisition' to 'Create Request for Quotation'

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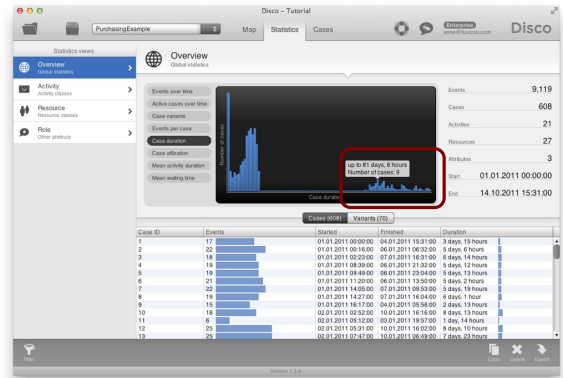
Step 4 - Inspect Statistics

Look at 'Statistics' tab to see 'Overview' information about the event log

- 9,119 events were recorded for 608 cases
- Timeframe is January - October 2011

The 'Case duration' is typically up to 15 or 16 days, but some cases take very long (more than 70 or 80 days!)

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Step 5 - Inspect Cases

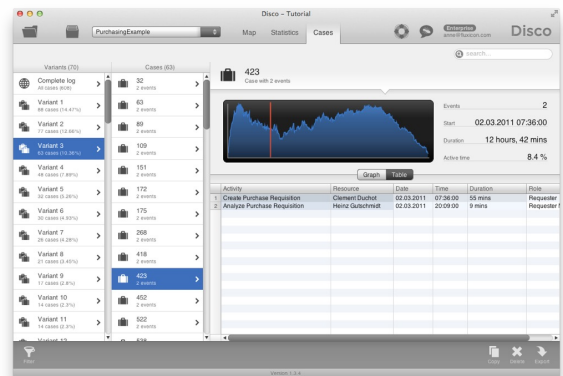
Select 'Cases' tab to inspect variants and individual service instances

- The third most frequent process variant ends after 'Analyze Purchase Requisition' (ca. 10.36% of all cases follow this pattern)

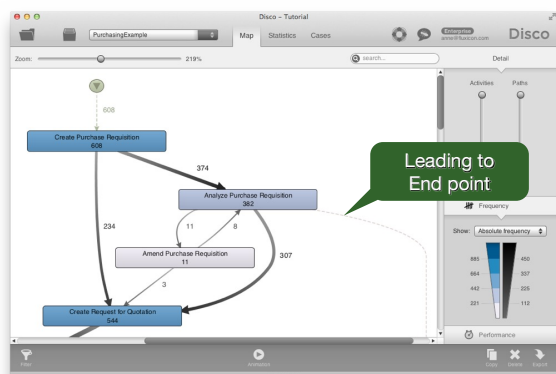
→ Why are so many requests abrupted?

- Do people not know what they can buy?
- We can find this back in the process map, too

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Results so far...

Original Questions:

1. How does the process actually look like?
 - Objective process map discovered
 - Lots of amendments and stopped requests: **Update of purchasing guidelines needed**
2. Are there deviations from the prescribed process?
3. Do we meet the performance targets?
 - Not by all (some take longer than 21 days): **Is there a bottleneck in the process? -> Next**

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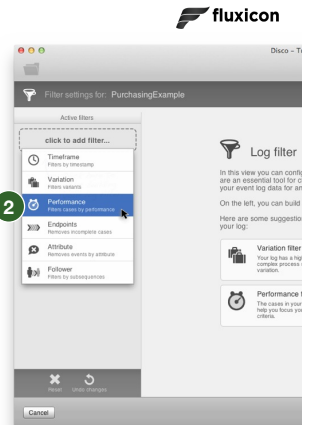
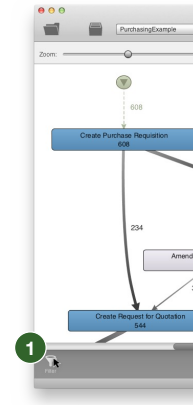
Step 6 - Filter on Performance

Click on the Filter symbol in the lower left corner and add a Performance filter

- Select 21 days as lower boundary
- You'll see that ca. 15% of the purchase orders take longer than 21 days

Press 'Apply filter' to focus only on those cases that take longer than 21 days

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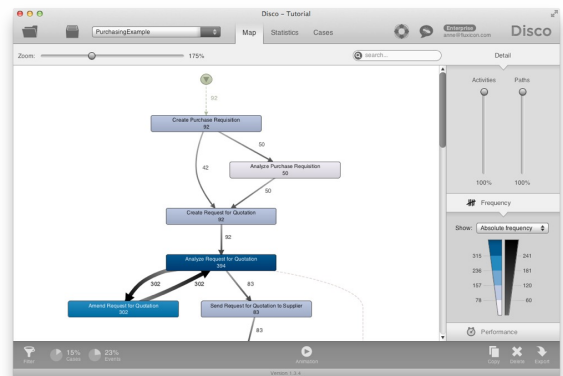
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Step 7 - Spot Bottlenecks

The filtered process map shows the process flow for the 92 (15%) 'slow' cases

- On average 3 amendments per case!
- 92 cases, 302 amendments...

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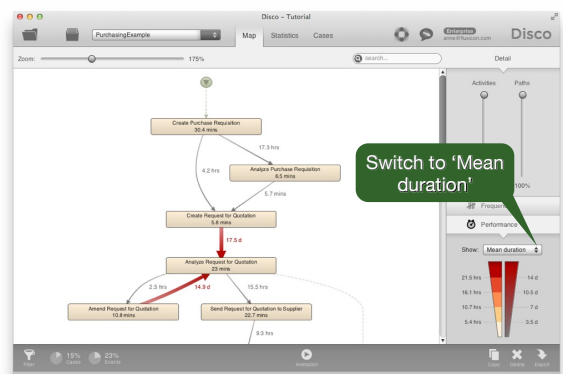
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Step 7b - Spot Bottlenecks

Switch to 'Performance' view

- 'Total duration' shows the high-impact areas
- Switch to 'Mean duration':
 - On average it takes **more than 14 days** to return from the rework loop to the normal process
 - What about min and max duration?

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Step 8 - Animate Process

Visualize bottleneck:

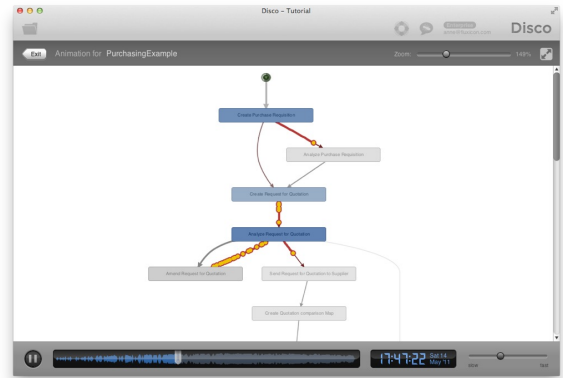
Press ▶ button to start animation

Observe how purchase orders move through the process

Drag needle to the end of the timeline

- observe how the most used paths get thicker and thicker

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Results so far...

1. How does the process actually look like?
 - Objective process map discovered
 - Lots of amendments and stopped requests:
Update of purchasing guidelines needed
2. Are there deviations from the prescribed process? -> **Next**
3. Do we meet the performance targets?
 - Not by all (some take longer than 21 days)
 - The 'Analyze Request for Quotation' activity is a huge bottleneck: **Process change is needed**

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Step 9 - Compliance Check

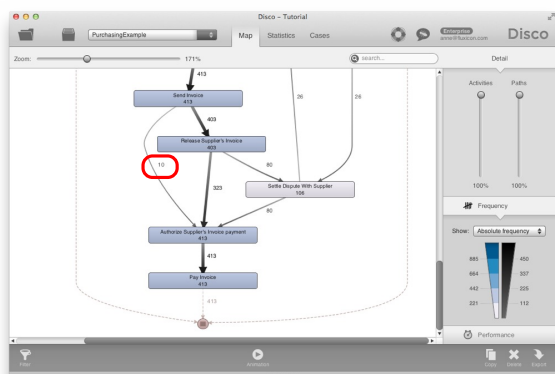
Exit the animation, return to Filter settings, and remove performance filter



Switch back to Frequency Map view and scroll to end of the process

- 10 cases skip the mandatory 'Release Supplier's Invoice' activity!

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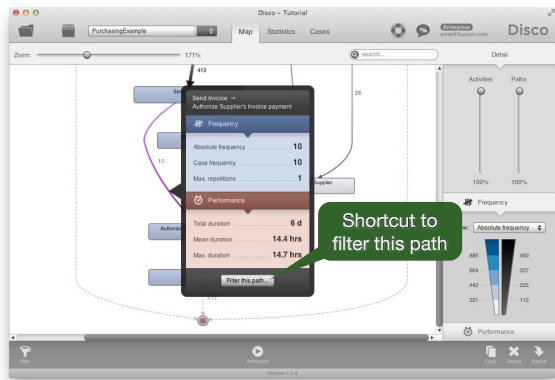
Step 9 - Compliance Check

Drill down: Click on the path from 'Send invoice' to 'Authorize Supplier's Invoice payment' and press 'Filter this path...'

Switch to Cases view to see the 10 cases

- Actionable result: We can either change the operational system to prevent the violation or provide targeted training

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Results so far...

1. How does the process actually look like?
 - Objective process map discovered
 - Lots of amendments and stopped requests: **Update of purchasing guidelines needed**
2. Are there deviations from the prescribed process? -> **Yes, training or system change needed**
3. Do we meet the performance targets?
 - Not by all (some take longer than 21 days)
 - The 'Analyze Request for Quotation' activity is a huge bottleneck: **Process change is needed**

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Step 10 - Organizational View

Last Step: We seek an alternative view on the data to visualize the organizational flow

Go to 'Project view' and press 'Reload':



Set 'Activity' column to 'Other' and configure 'Role' column as 'Activity'

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Case ID	Start Timestamp	Complete Timestamp	Activity	Role	Role
1	2011-01-01 00:00:00.000	2011-01-01 00:30:00.000	Create Purchase Request	Kim Pasa	Requester
2	2011-01-01 00:16:00.000	2011-01-01 00:28:00.000	Create Purchase Request	Kim Pasa	Requester
3	2011-01-01 00:23:00.000	2011-01-01 00:30:00.000	Create Purchase Request	Kim Pasa	Requester
4	2011-01-01 00:37:00.000	2011-01-01 00:45:00.000	Analyze Request for Quotation	Kim Pasa	Requester
5	2011-01-01 00:41:00.000	2011-01-01 00:50:00.000	Analyze Request for Quotation	Kim Pasa	Requester
6	2011-01-01 00:58:00.000	2011-01-01 00:58:00.000	Create Request for Quotation	Kim Pasa	Requester
7	2011-01-01 00:58:00.000	2011-01-01 00:58:00.000	Create Request for Quotation	Kim Pasa	Requester
8	2011-01-01 00:58:00.000	2011-01-01 00:58:00.000	Create Request for Quotation	Kim Pasa	Requester
9	2011-01-01 00:58:00.000	2011-01-01 00:58:00.000	Create Request for Quotation	Kim Pasa	Requester
10	2011-01-01 00:58:00.000	2011-01-01 00:58:00.000	Create Request for Quotation	Kim Pasa	Requester
11	2011-01-01 00:58:00.000	2011-01-01 00:58:00.000	Create Request for Quotation	Kim Pasa	Requester
12	2011-01-01 00:58:00.000	2011-01-01 00:58:00.000	Create Request for Quotation	Kim Pasa	Requester
13	2011-01-01 00:58:00.000	2011-01-01 00:58:00.000	Create Request for Quotation	Kim Pasa	Requester
14	2011-01-01 00:58:00.000	2011-01-01 00:58:00.000	Create Request for Quotation	Kim Pasa	Requester
15	2011-01-01 00:58:00.000	2011-01-01 00:58:00.000	Create Request for Quotation	Kim Pasa	Requester
16	2011-01-01 00:58:00.000	2011-01-01 00:58:00.000	Create Request for Quotation	Kim Pasa	Requester
17	2011-01-01 00:58:00.000	2011-01-01 00:58:00.000	Create Request for Quotation	Kim Pasa	Requester
18	2011-01-01 00:58:00.000	2011-01-01 00:58:00.000	Create Request for Quotation	Kim Pasa	Requester
19	2011-01-01 00:58:00.000	2011-01-01 00:58:00.000	Create Request for Quotation	Kim Pasa	Requester
20	2011-01-01 00:58:00.000	2011-01-01 00:58:00.000	Create Request for Quotation	Kim Pasa	Requester
21	2011-01-01 00:58:00.000	2011-01-01 00:58:00.000	Create Request for Quotation	Kim Pasa	Requester
22	2011-01-01 00:58:00.000	2011-01-01 00:58:00.000	Create Request for Quotation	Kim Pasa	Requester
23	2011-01-01 00:58:00.000	2011-01-01 00:58:00.000	Create Request for Quotation	Kim Pasa	Requester
24	2011-01-01 00:58:00.000	2011-01-01 00:58:00.000	Create Request for Quotation	Kim Pasa	Requester
25	2011-01-01 00:58:00.000	2011-01-01 00:58:00.000	Create Request for Quotation	Kim Pasa	Requester
26	2011-01-01 00:58:00.000	2011-01-01 00:58:00.000	Create Request for Quotation	Kim Pasa	Requester
27	2011-01-01 00:58:00.000	2011-01-01 00:58:00.000	Create Request for Quotation	Kim Pasa	Requester
28	2011-01-01 00:58:00.000	2011-01-01 00:58:00.000	Create Request for Quotation	Kim Pasa	Requester
29	2011-01-01 00:58:00.000	2011-01-01 00:58:00.000	Create Request for Quotation	Kim Pasa	Requester
30	2011-01-01 00:58:00.000	2011-01-01 00:58:00.000	Create Request for Quotation	Kim Pasa	Requester

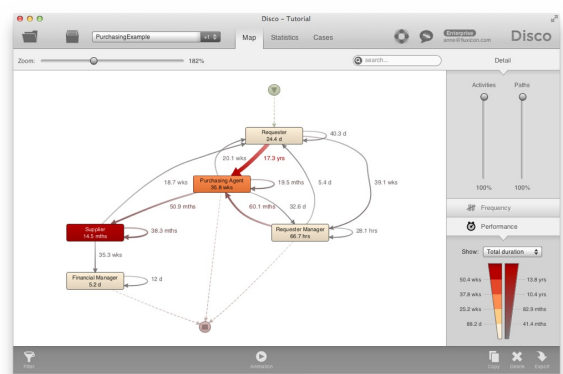
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Step 10 - Organizational View

Instead of the activity flow, we are now looking at how the process moves through different *roles* in the organization

- Inefficiencies can often be found at the borders of organizational units
- Clearly, the Purchasing agents are causing the biggest delays in the process!

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