How to Manage your Process Mining Analysis - Best Practices and Challenges

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Process Mining Camp

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Atos Managed Services

- Atos Managed Services

  Manage customer ICT infrastructure
  - Host infrastructure for enterprise applications like SAP
  - Provide private cloud services
  - Deliver IT when it really counts: Olympic Games

- Challenges

Trouble-free operation (it should always work)	<->	Flexible infrastructure
Maximum availability and security	<->	Low cost
Innovative technology	<->	Legacy applications still required
Standard technology and processes	<->	Custom requirements

- Focus today: Incident management

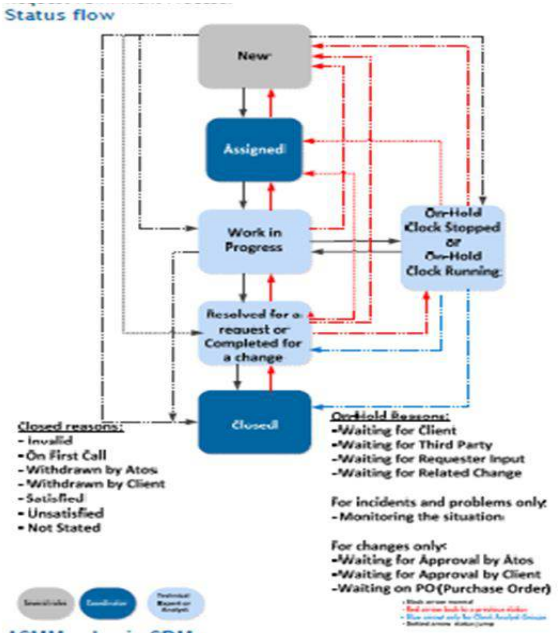
Overview

- Present and keep track of analysis results
- Taking different perspectives on the data
- Data wrangling challenges
- Process mining: Where it fits in the organization

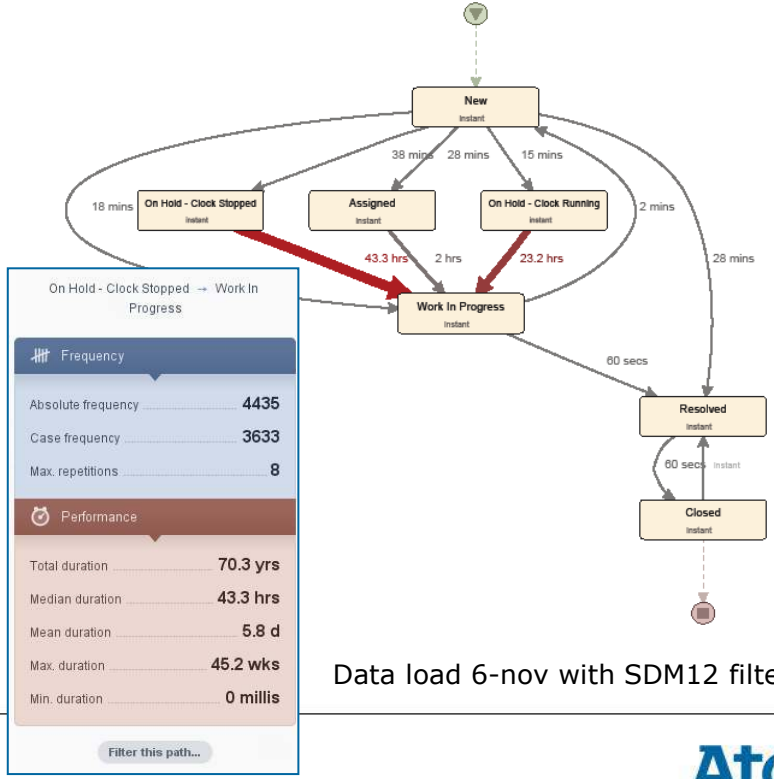
How to Present and Keep Track of Your Analysis Results?

Ideal process SDM12 <-> Real life SDM12

SDM 12 Manual



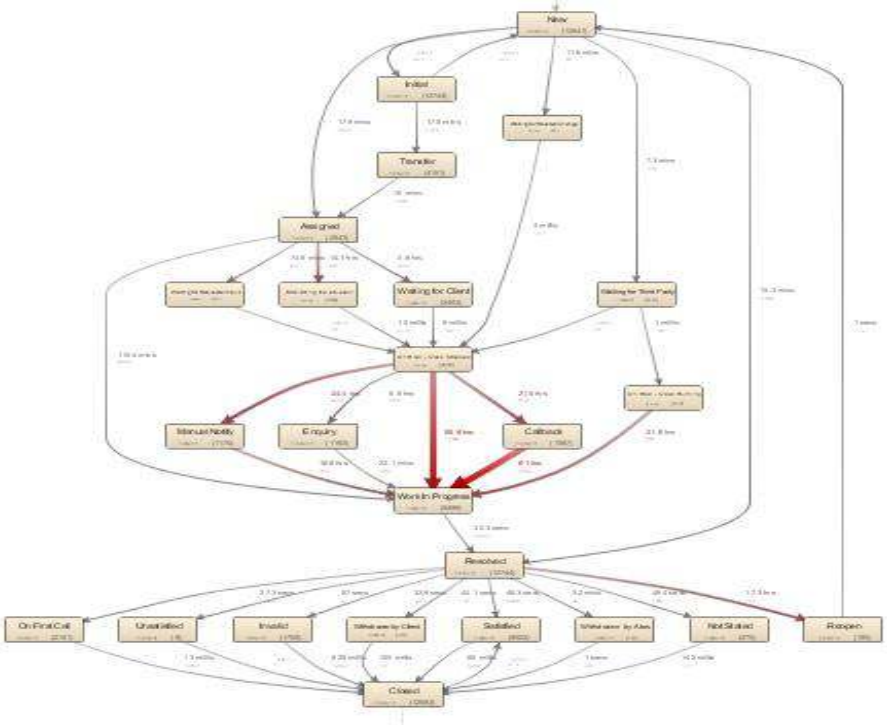
DISCO analysis



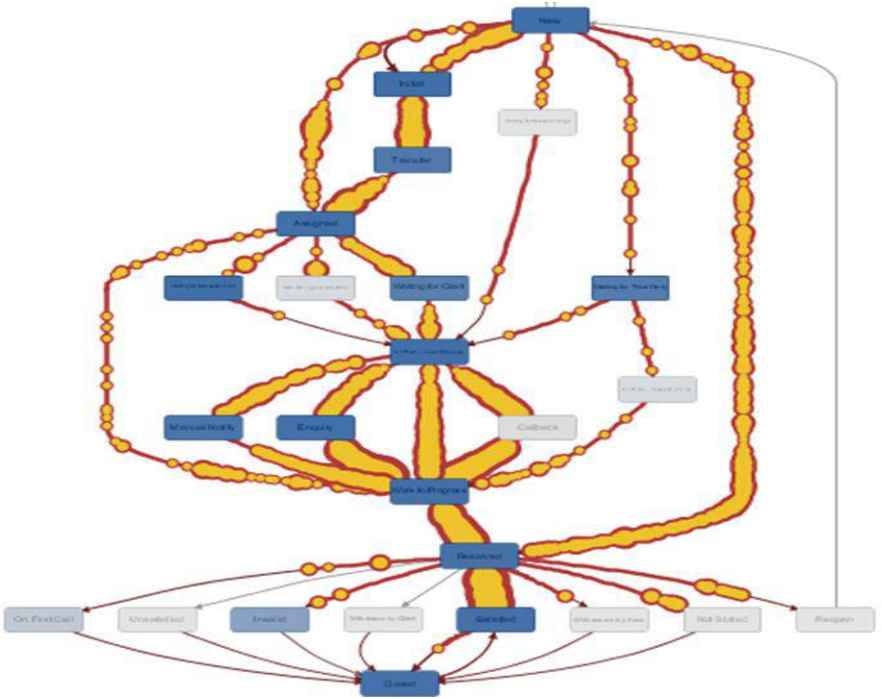
Data load 6-nov with SDM12 filter

Incidents with hold reasons + close reason

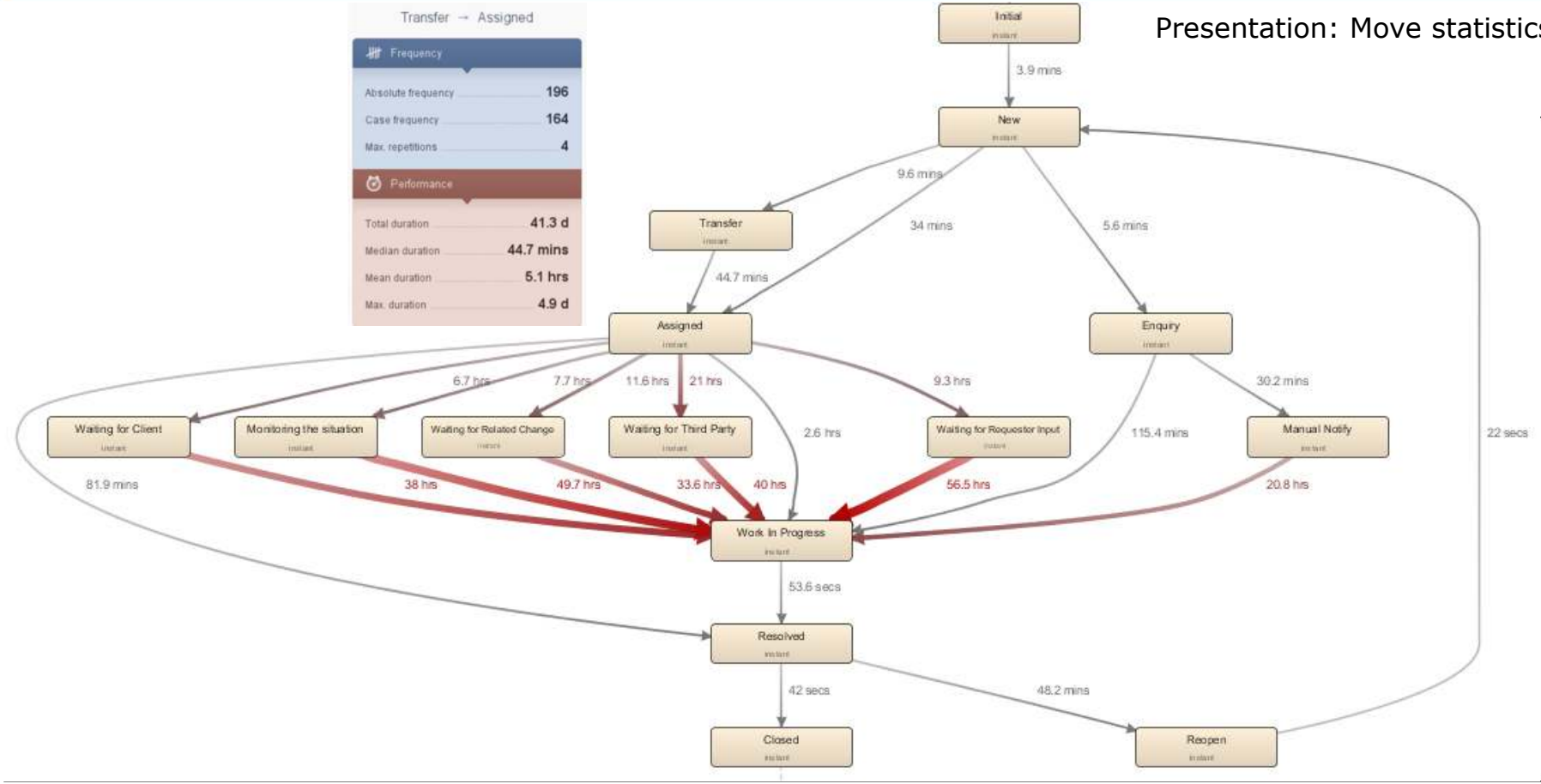
Static view



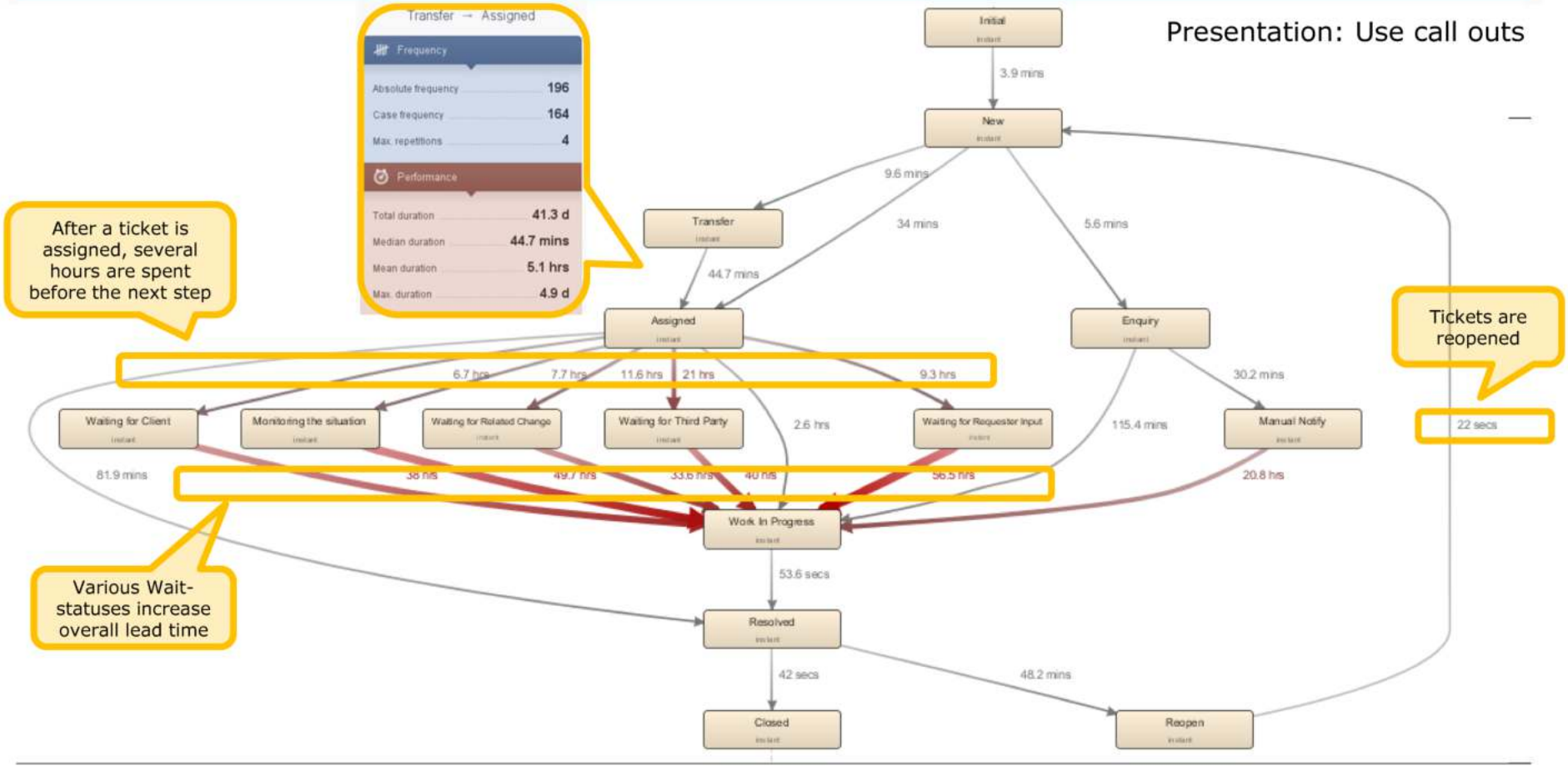
Animation view (replay)



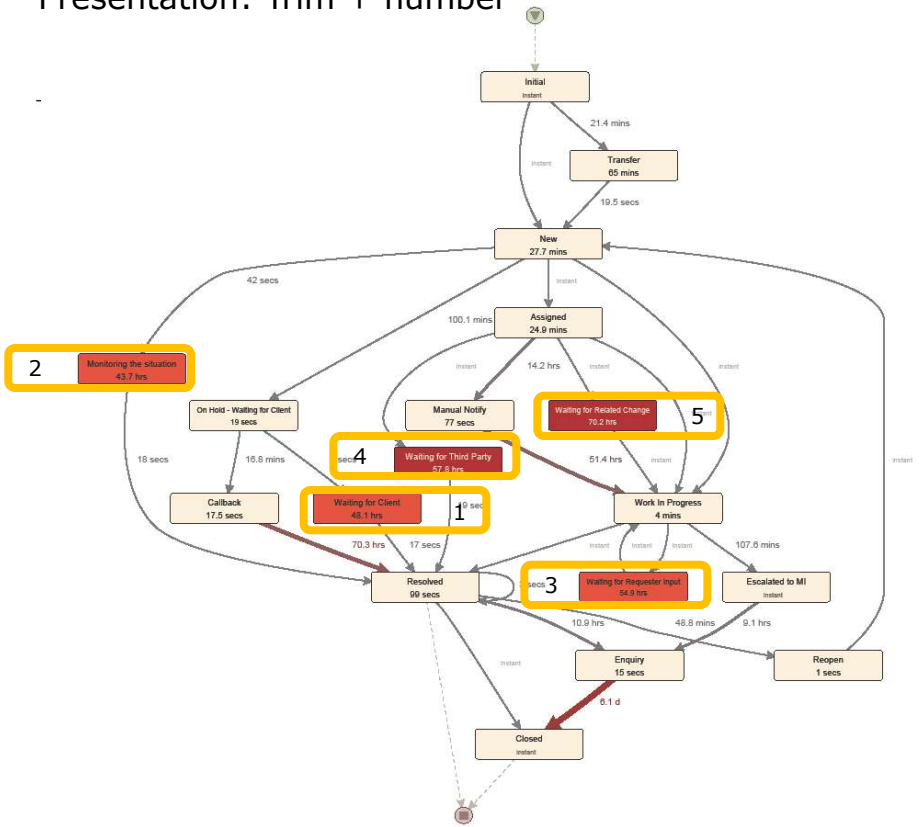
Presentation: Move statistics



Presentation: Use call outs



Presentation: Trim + number



Analysis 1.1: Incident management

1. Waiting for client:
   median: 2 days, max > 19 weeks
2. Monitoring the situation:
   - median 2 days, max > 10 weeks
   - appears quite often (>10%)
   - strange place in process
3. Waiting-for-requester-input
   - appears during WIP and not instead of waiting-for-client (not common, but correct)
   - median: 2 days, max > 9 weeks
4. Waiting for 3th party:
   median: 2.5 days, max > 5 weeks
5. Waiting for related change:
   median: 3 days, max > 4 weeks

How to track results: projects, datasets, analyses

Observations: Change management -2-

Nr	Observation	Expert comment	Root cause	Further analysis
1.1	WFTs do not follow a similar scheme/order of tasks			Is it useful to further analyze this (look for common
1.2	Number of approval tasks depends on category, no format visible			
	Approval tasks do not tend to slow down the process, but there are some exceptions (20 days)			
1.3	There are a (small) number of production tickets with subtasks although this is not allowed			

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Analysis 1.2: Approvals in top 15% non-standard changes

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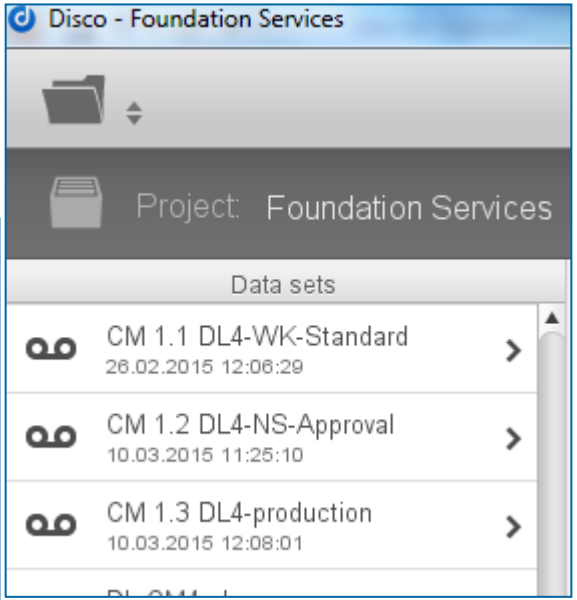

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To summarize: take away points

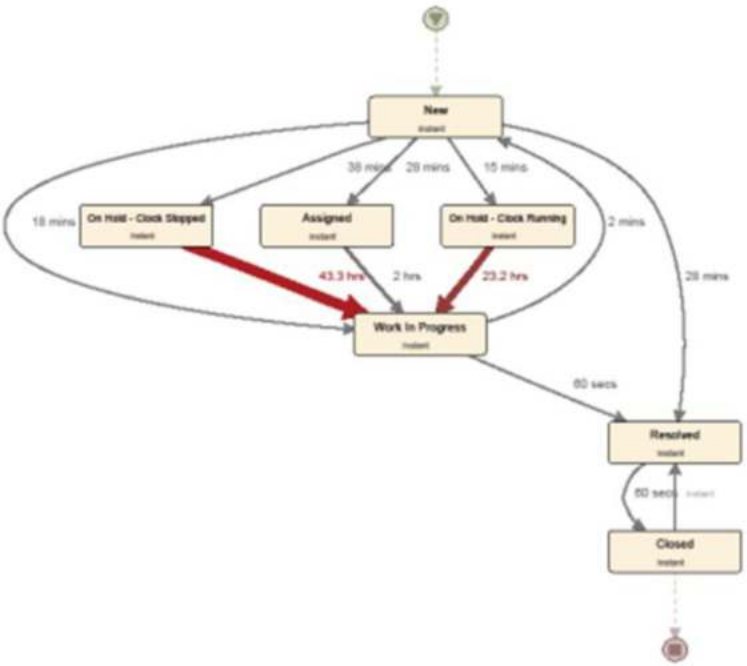
- Presentation
  As a process mining analyst, when you present your results your task is to choose what to show and to bring it into the right context. Overlaying the maps and statistics with highlights and comments helps to convey the message.

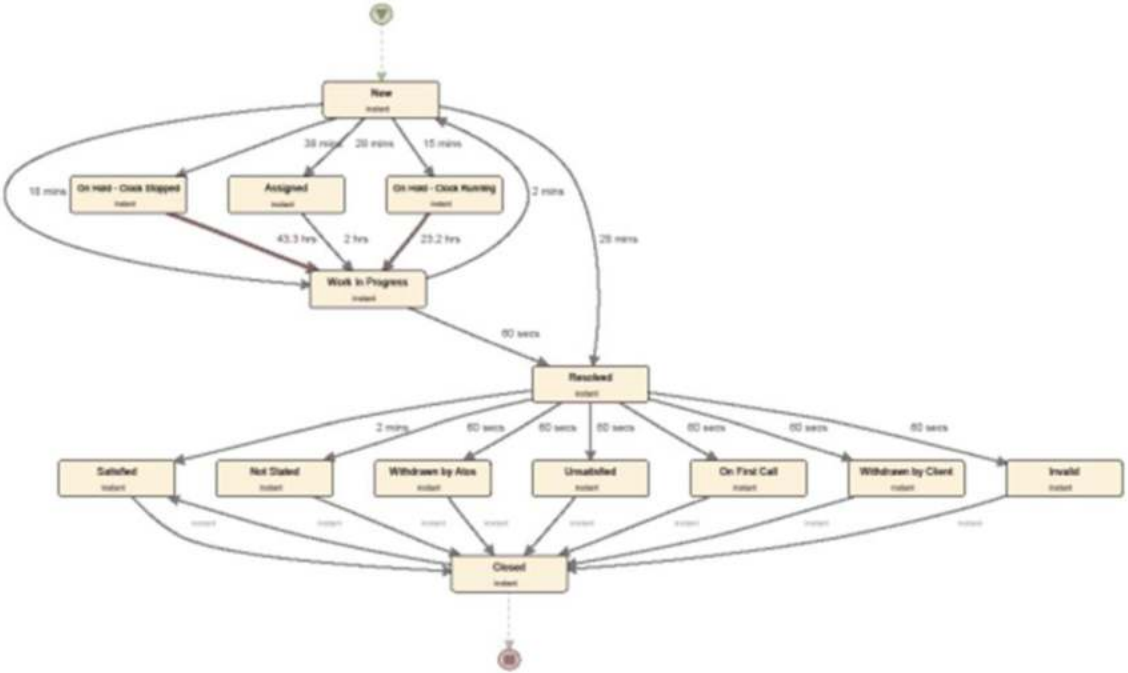
- Keep track
  To keep track of your observations, use a structured approach numbering your data sets and use these identifiers as cross-references in your projects, presentations, and action point lists

Taking Different Perspectives on the Data

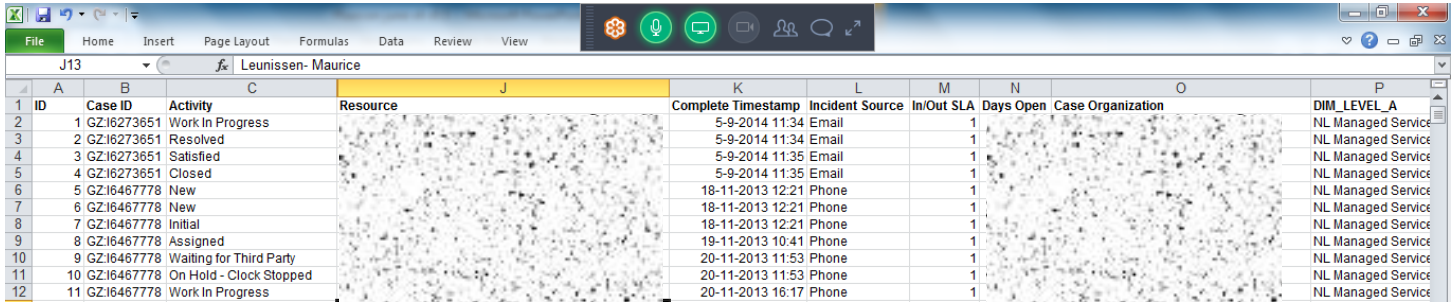
1 – Multiple columns

Zoom in on close reasons: result

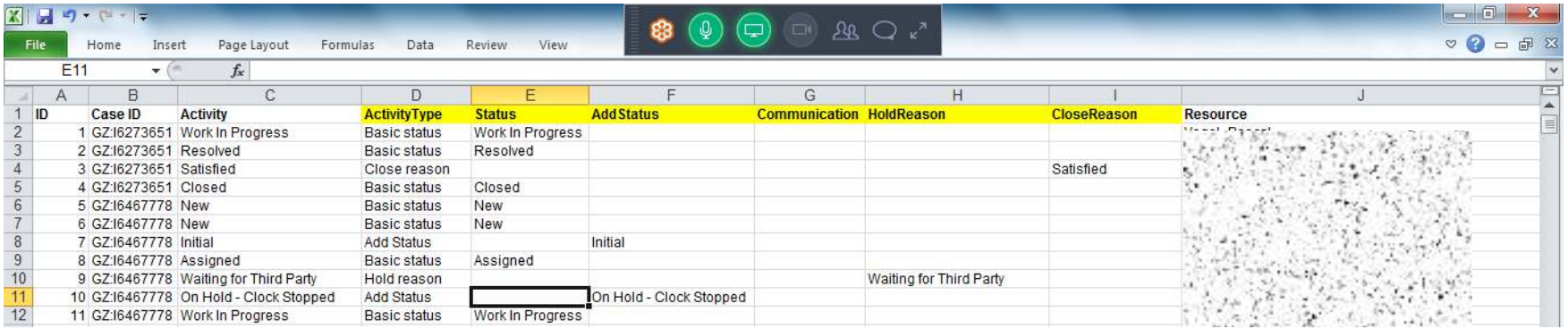




What was the problem: lots of activities

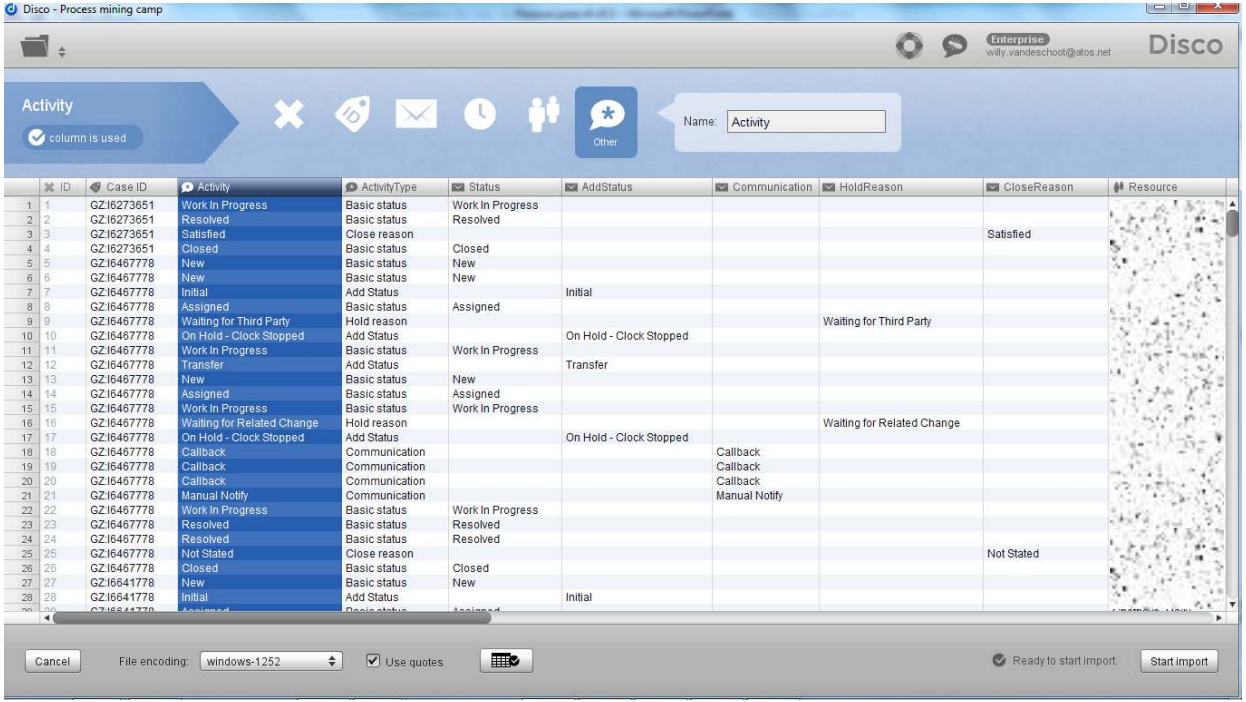


	A	B	C	J	K	L	M	N	O	P
1	ID	Case ID	Activity	Resource	Complete Timestamp	Incident Source	In/Out SLA	Days Open	Case Organization	DIM_LEVEL_A
2	1	GZ:I6273651	Work In Progress		5-9-2014 11:34	Email	1			NL Managed Service
3	2	GZ:I6273651	Resolved		5-9-2014 11:34	Email	1			NL Managed Service
4	3	GZ:I6273651	Satisfied		5-9-2014 11:35	Email	1			NL Managed Service
5	4	GZ:I6273651	Closed		5-9-2014 11:35	Email	1			NL Managed Service
6	5	GZ:I6467778	New		18-11-2013 12:21	Phone	1			NL Managed Service
7	6	GZ:I6467778	New		18-11-2013 12:21	Phone	1			NL Managed Service
8	7	GZ:I6467778	Initial		18-11-2013 12:21	Phone	1			NL Managed Service
9	8	GZ:I6467778	Assigned		19-11-2013 10:41	Phone	1			NL Managed Service
10	9	GZ:I6467778	Waiting for Third Party		20-11-2013 11:53	Phone	1			NL Managed Service
11	10	GZ:I6467778	On Hold - Clock Stopped		20-11-2013 11:53	Phone	1			NL Managed Service
12	11	GZ:I6467778	Work In Progress		20-11-2013 16:17	Phone	1			NL Managed Service



	A	B	C	D	E	F	G	H	I	J
1	ID	Case ID	Activity	ActivityType	Status	AddStatus	Communication	HoldReason	CloseReason	Resource
2	1	GZ:I6273651	Work In Progress	Basic status	Work In Progress					
3	2	GZ:I6273651	Resolved	Basic status	Resolved					
4	3	GZ:I6273651	Satisfied	Close reason					Satisfied	
5	4	GZ:I6273651	Closed	Basic status	Closed					
6	5	GZ:I6467778	New	Basic status	New					
7	6	GZ:I6467778	New	Basic status	New					
8	7	GZ:I6467778	Initial	Add Status		Initial				
9	8	GZ:I6467778	Assigned	Basic status	Assigned					
10	9	GZ:I6467778	Waiting for Third Party	Hold reason				Waiting for Third Party		
11	10	GZ:I6467778	On Hold - Clock Stopped	Add Status		On Hold - Clock Stopped				
12	11	GZ:I6467778	Work In Progress	Basic status	Work In Progress					

Zoom in on close reasons: preparation



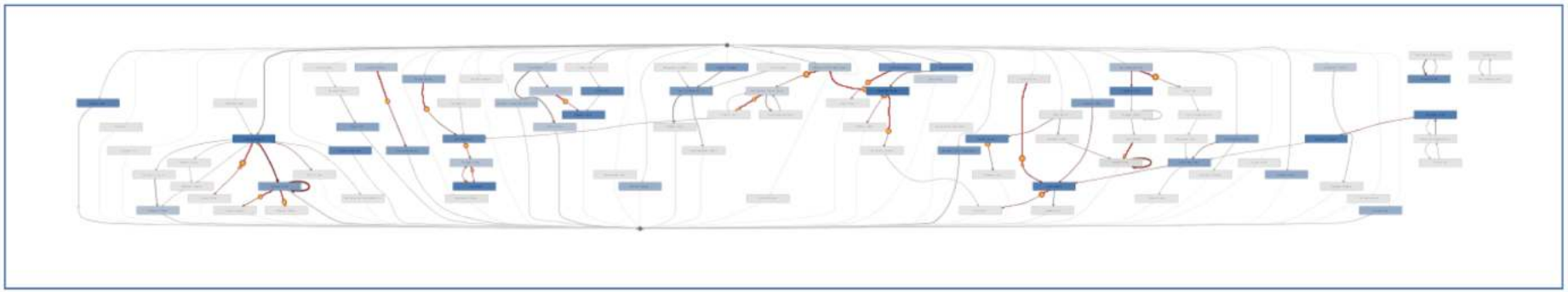
	ID	Case ID	Activity	ActivityType	Status	AddStatus	Communication	HoldReason	CloseReason	Resource
1	1	GZ16273651	Work In Progress	Basic status	Work In Progress					
2	2	GZ16273651	Resolved	Basic status	Resolved					
3	3	GZ16273651	Satisfied	Close reason					Satisfied	
4	4	GZ16273651	Closed	Basic status	Closed					
5	5	GZ16467778	New	Basic status	New					
6	6	GZ16467778	New	Basic status	New					
7	7	GZ16467778	Initial	Add Status		Initial				
8	8	GZ16467778	Assigned	Basic status	Assigned					
9	9	GZ16467778	Waiting for Third Party	Hold reason				Waiting for Third Party		
10	10	GZ16467778	On Hold - Clock Stopped	Add Status		On Hold - Clock Stopped				
11	11	GZ16467778	Work In Progress	Basic status	Work In Progress					
12	12	GZ16467778	Transfer	Add Status		Transfer				
13	13	GZ16467778	New	Basic status	New					
14	14	GZ16467778	Assigned	Basic status	Assigned					
15	15	GZ16467778	Work In Progress	Basic status	Work In Progress					
16	16	GZ16467778	Waiting for Related Change	Hold reason				Waiting for Related Change		
17	17	GZ16467778	On Hold - Clock Stopped	Add Status		On Hold - Clock Stopped				
18	18	GZ16467778	Callback	Communication			Callback			
19	19	GZ16467778	Callback	Communication			Callback			
20	20	GZ16467778	Callback	Communication			Callback			
21	21	GZ16467778	Manual Notify	Communication			Manual Notify			
22	22	GZ16467778	Work In Progress	Basic status	Work In Progress					
23	23	GZ16467778	Resolved	Basic status	Resolved					
24	24	GZ16467778	Resolved	Basic status	Resolved					
25	25	GZ16467778	Not Stated	Close reason					Not Stated	
26	26	GZ16467778	Closed	Basic status	Closed					
27	27	GZ16641778	New	Basic status	New					
28	28	GZ16641778	Initial	Add Status		Initial				

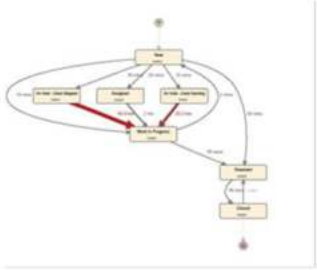
- Original data
  - 1 column for all activities (combined)
- Preparation in dataset:
  - ActivityType is added as column
  - Activities are split in separate columns
- Preparation in Disco
  - Original activity column is not used
  - ActivityType is included as filter
  - Various activity columns are ALL selected as Activity

Taking Different Perspectives on the Data

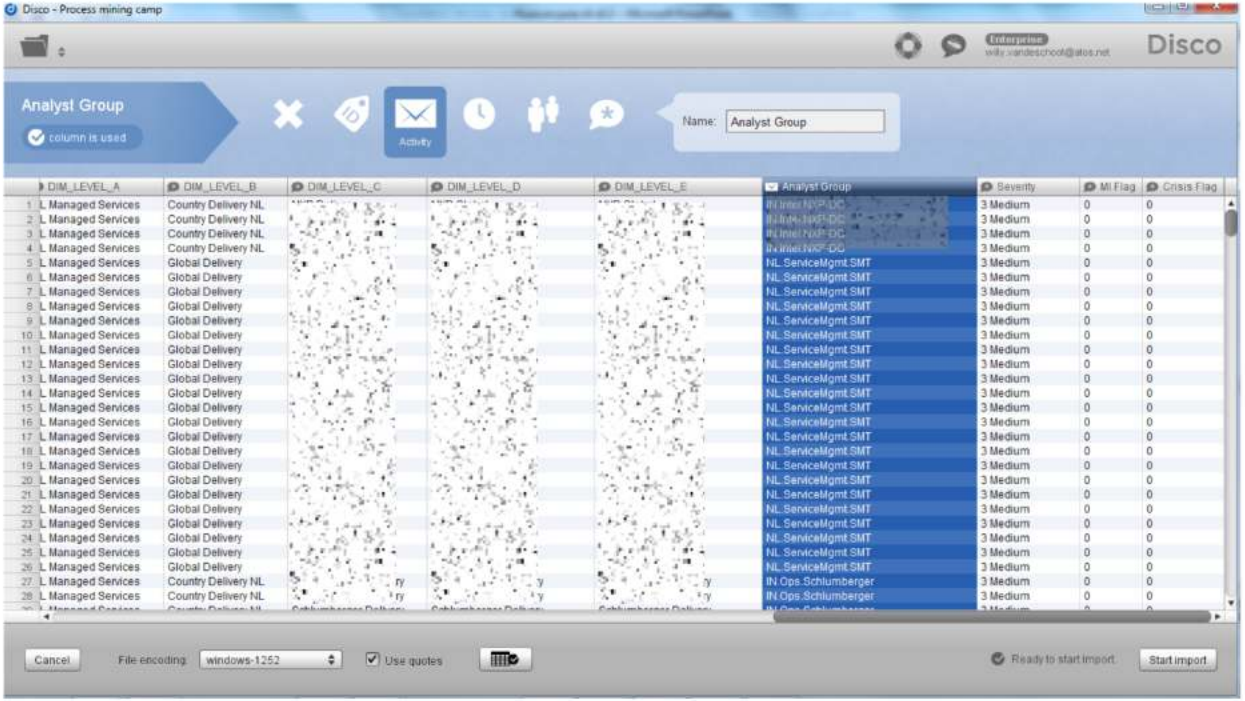
1 – Alternative columns

Perspective on engineers: result





Perspective on teams : preparation

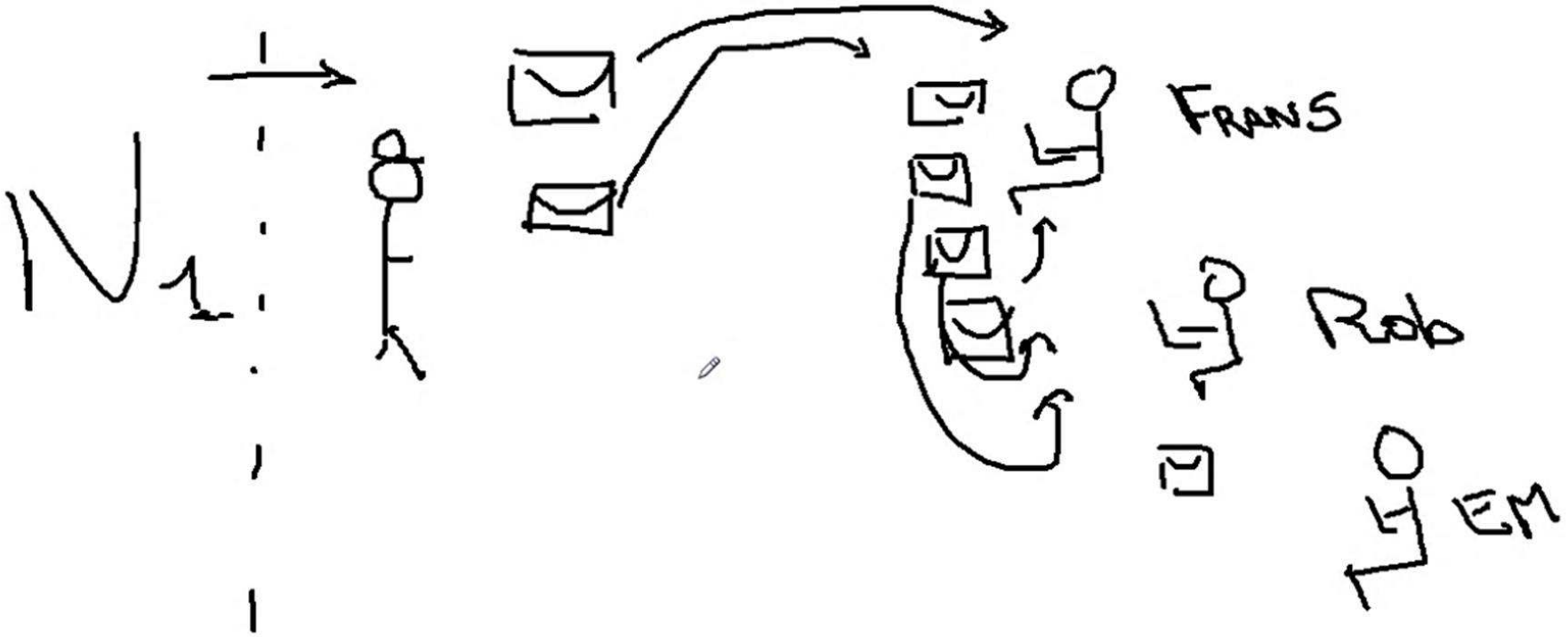


- In dataset:
  - No preparation required !!!
- In Disco
  - Original activity column(s) is/are not used
  - Resource column is selected as activity instead of original column

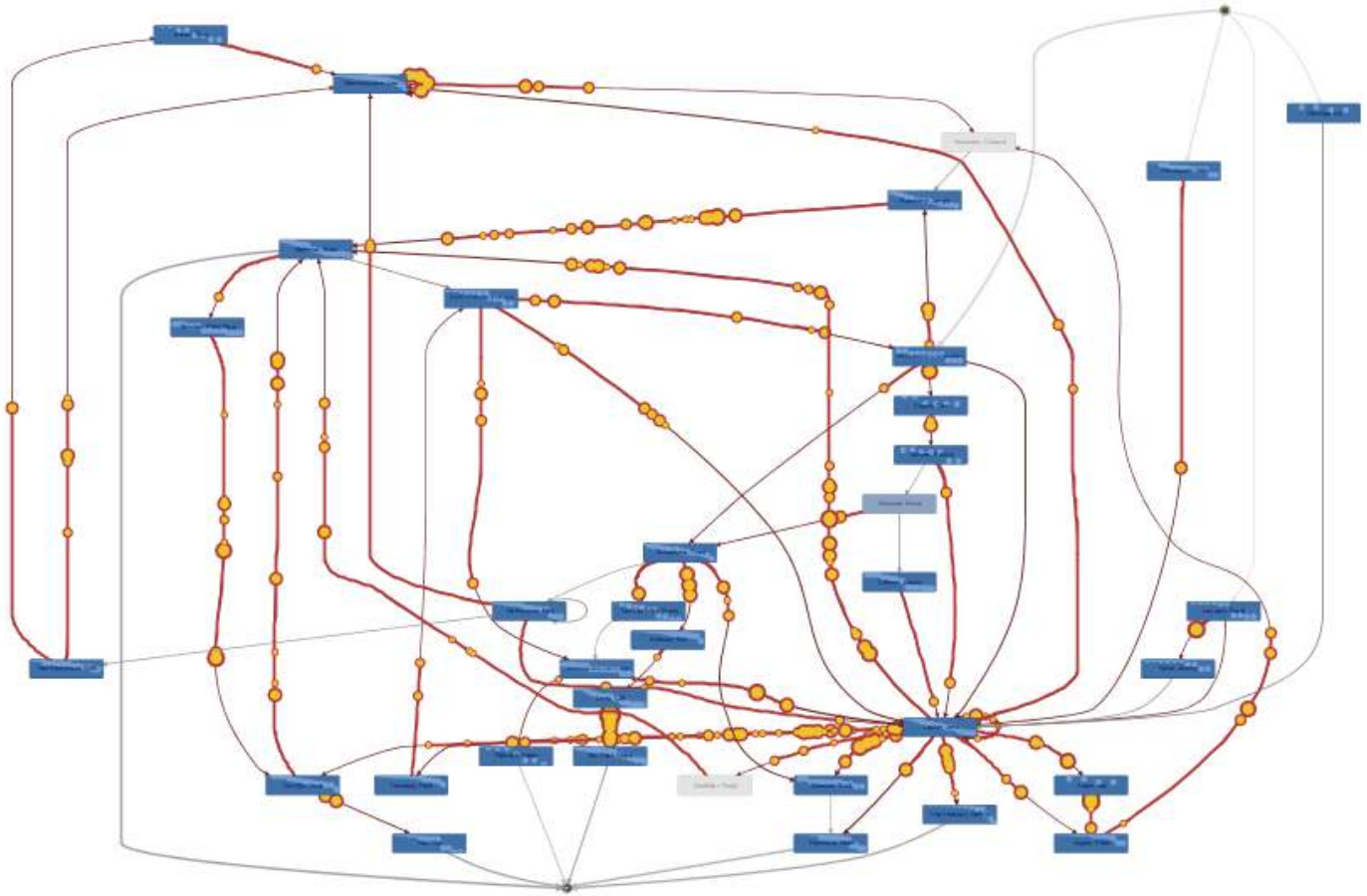
Taking Different Perspectives on the Data

3 – Combination of Multiple columns and Alternative columns

Analysis of interaction: Inspiration

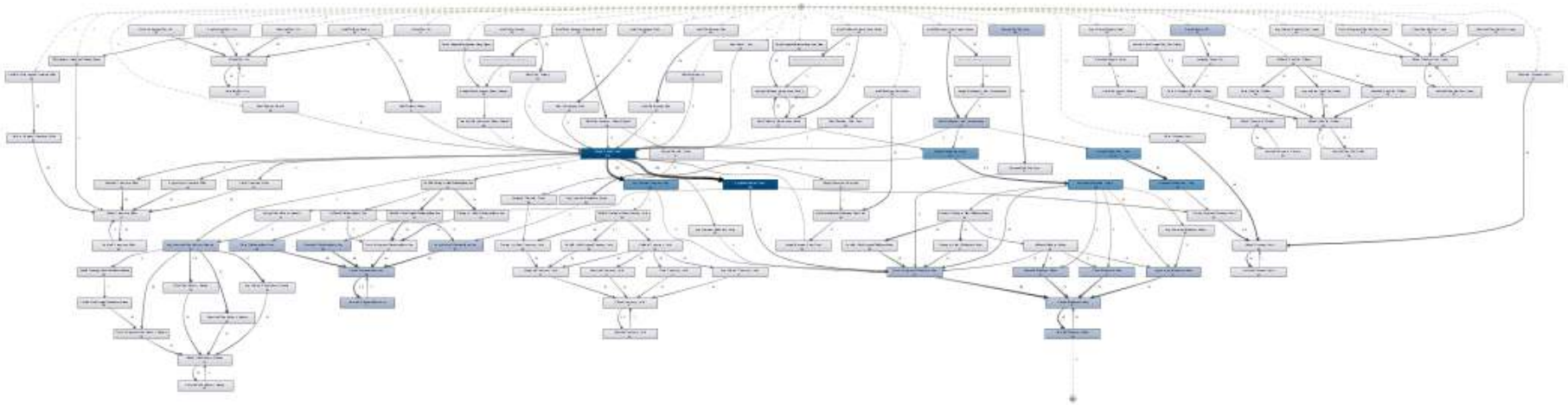


Analysis of interaction: Result - Engineers



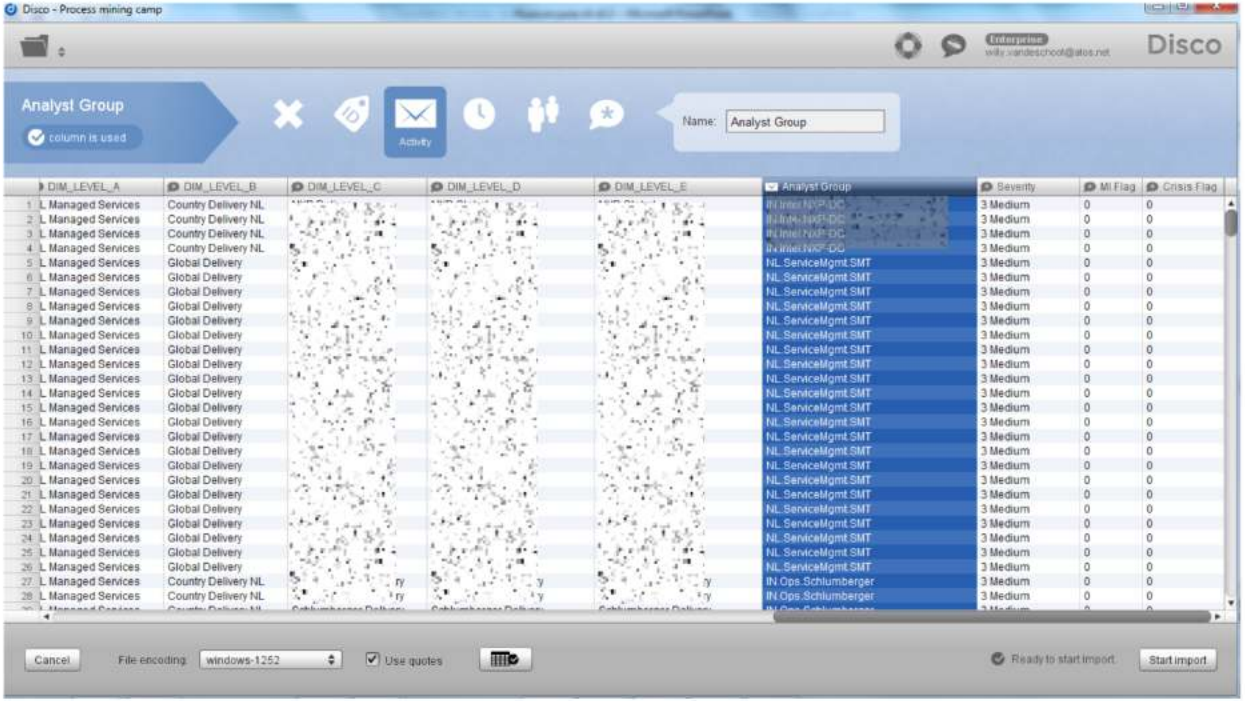
Activity = Engineer

Analysis of interaction: Result–Process/engineer



Activity = Activity + Engineer

Process per team : preparation



- In dataset:
  - No preparation required !!!
- In Disco
  - Original activity column(s) is/are used as in original process map
  - Resource is ADDED as activity

To summarize: take away points

- Explore alternative views on the data, beyond the obvious ones that you first think of. You can import and analyze your data in very different ways, opening up completely new perspectives:
  - Try using attributes to hide and add detail to your process
  - Try alternative columns as activity name
  - Combine columns to get even more detailed views in different dimensions
- Work with the process owners to create a view on the process that reflects how they think

Data wrangling

Challenges

Data wrangling: challenges

- Tooling & technicalities
  - MS Access bugs (size limitations)
- Data issues
  - Timestamps are implicitly available (*)
  - Redundant timestamps (**)
  - Combination of activities and statuses (***)
  - Information in free text fields
  - Multiple database tables with varying data formats (integer/text)
  - Multiple database tables with probably non-matching content
  - Timestamps in various time zones and various formats
- Format for advanced analysis
  - Split/add columns

Data wrangling: specific issues -1-

- (*) From-to records
  - The database has records containing information that a status changes from A to B at time T
  - For Disco, this has to be wrangled
    - Select time in and time out per activity
    - Deduce additional timestamps for start and end of process

Database

Case	Timestamp	Change
10001	12-6-2015 9:22	New case
10001	12-6-2015 10:34	Status change to B
10001	12-6-2015 11:46	Status change from B to C
10001	12-6-2015 12:58	Status change from C to D
10001	12-6-2015 14:10	Status change from D to E
10001	12-6-2015 15:22	Case closed

Disco

Case	Activity	Time in	Time out
1001	A	12-6-2015 9:22	12-6-2015 10:34
1001	B	12-6-2015 10:34	12-6-2015 11:46
1001	C	12-6-2015 11:46	12-6-2015 12:58
1001	D	12-6-2015 12:58	12-6-2015 14:10
1001	E	12-6-2015 14:10	12-6-2015 15:22

Data wrangling: specific issues -2-

- (**) Grouped timestamps
  - If timestamps of events are very close to each other, and the records together describe in fact 1 “real life event”, Disco still assigns meaning to the order of these events
  - Easiest way to deal with this is to filter out all non-essential activities in Disco
  - Alternative is to create an omnibus activity with the minimum time in and maximum time out of relevant activities (before loading the data in Disco)

Case	Activity	Time in	Time out
1001	Close phase	12-6-2015 9:22	12-6-2015 10:34

Data wrangling: specific issues -3-

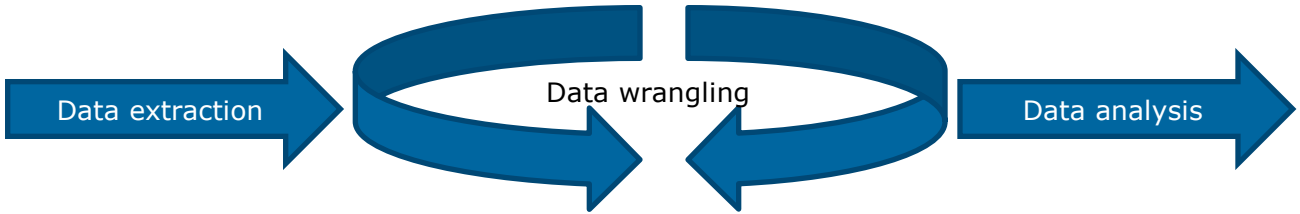
- (***) Activities and statuses
  - Data wrangling challenge
    - Activities only have time in, Statuses have time and time out
    - Activities happen during Statuses
  - Disco challenge
    - Mixing Status and Activity information does not give expected results in Disco
    - For now, we often use start times only

To summarize: take away points

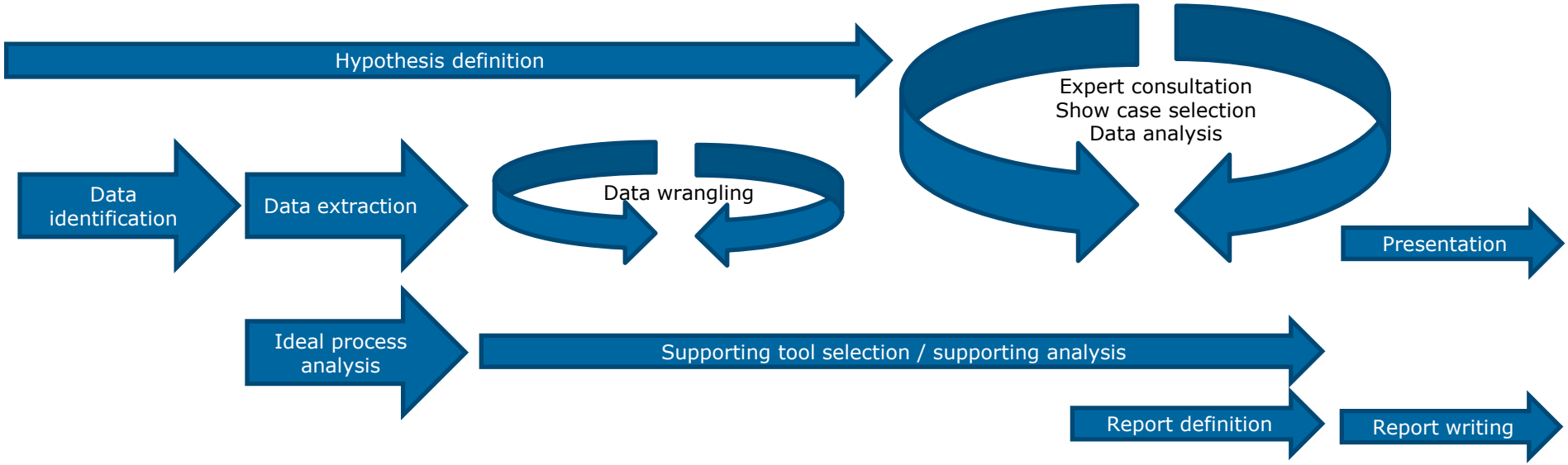
- Don’t assume that the data preprocessing tools cannot introduce errors: Check data quality at several points
- Consider analysis flexibility as a goal during data preparation

Process mining: Where does it fit in the organization

Way of working: Disco standard

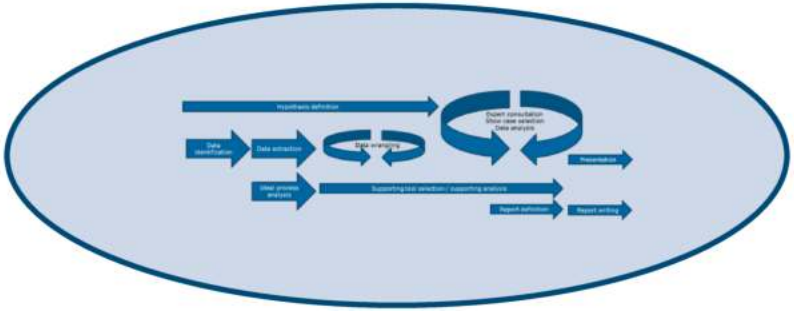


Way of working: iterative and interactive



Where does process mining fit in?

- Lean wave
- Process audit
- Continual improvement
  - Creating process awareness
  - Bridge gap management-engineers
- Account improvement plan
- Transition program
- New deal proposal
- Log file analysis
- Do-it-yourself analytics
- Punk analytics



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What have we learned so far?

- New KPI's with focus on overall lead time instead of strict SLA norms
- Audit-type findings: incorrect process, administration not kept up to date
- Increased process awareness
- Visualization of implicit knowledge
  Engineers comment: "I told you so"
  Managers comment: "Is it that bad"
- Increased awareness of complexity
  -> need for change
  -> change direction

Thanks

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