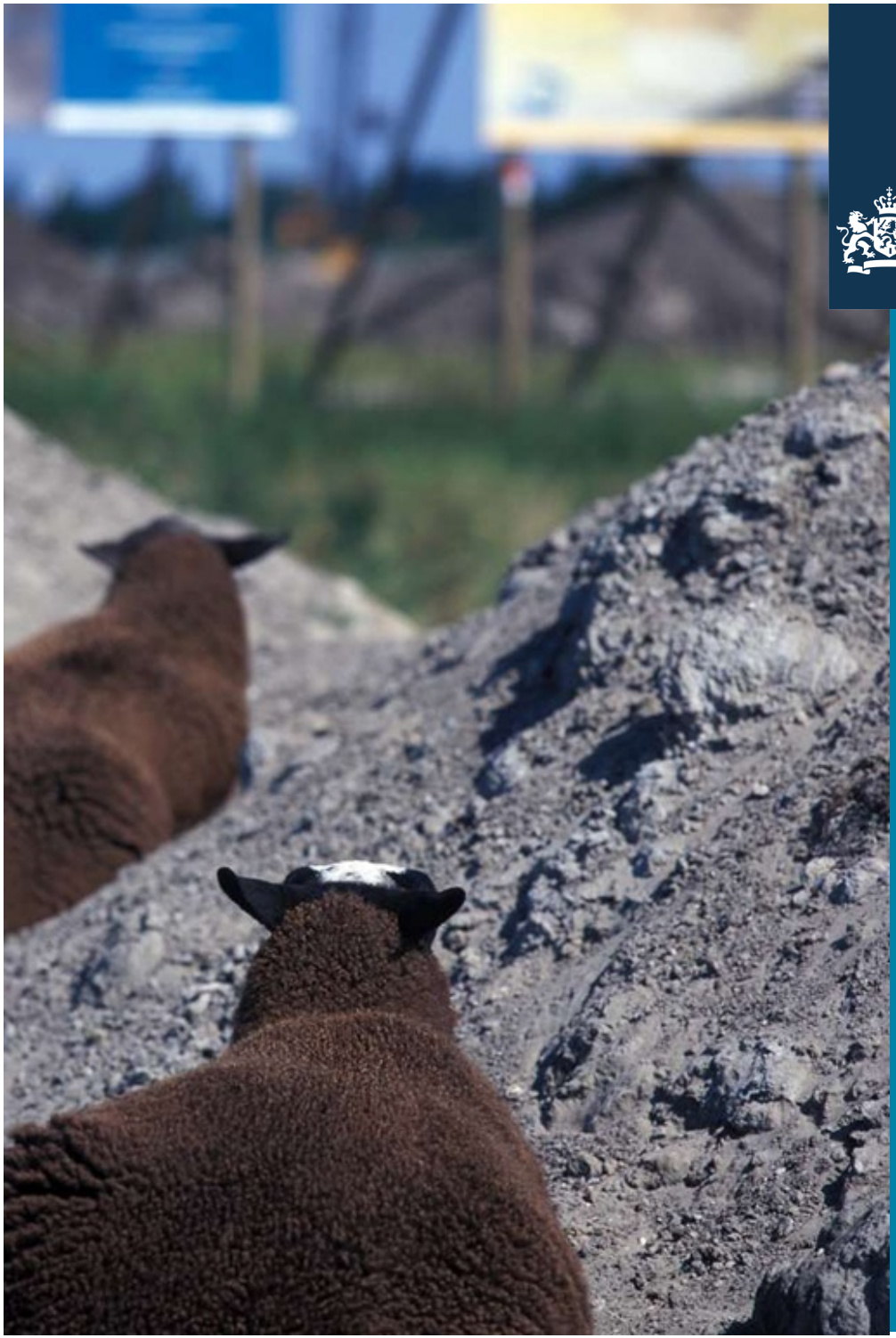
Dienst Uitvoering Onderwijs
Ministerie van Onderwijs, Cultuur en Wetenschap



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Process mining Camp 2015

Using Process mining in an event driven environment to monitor key performance indicators

Introduction (me and DUO)

DUO : a new student finance system

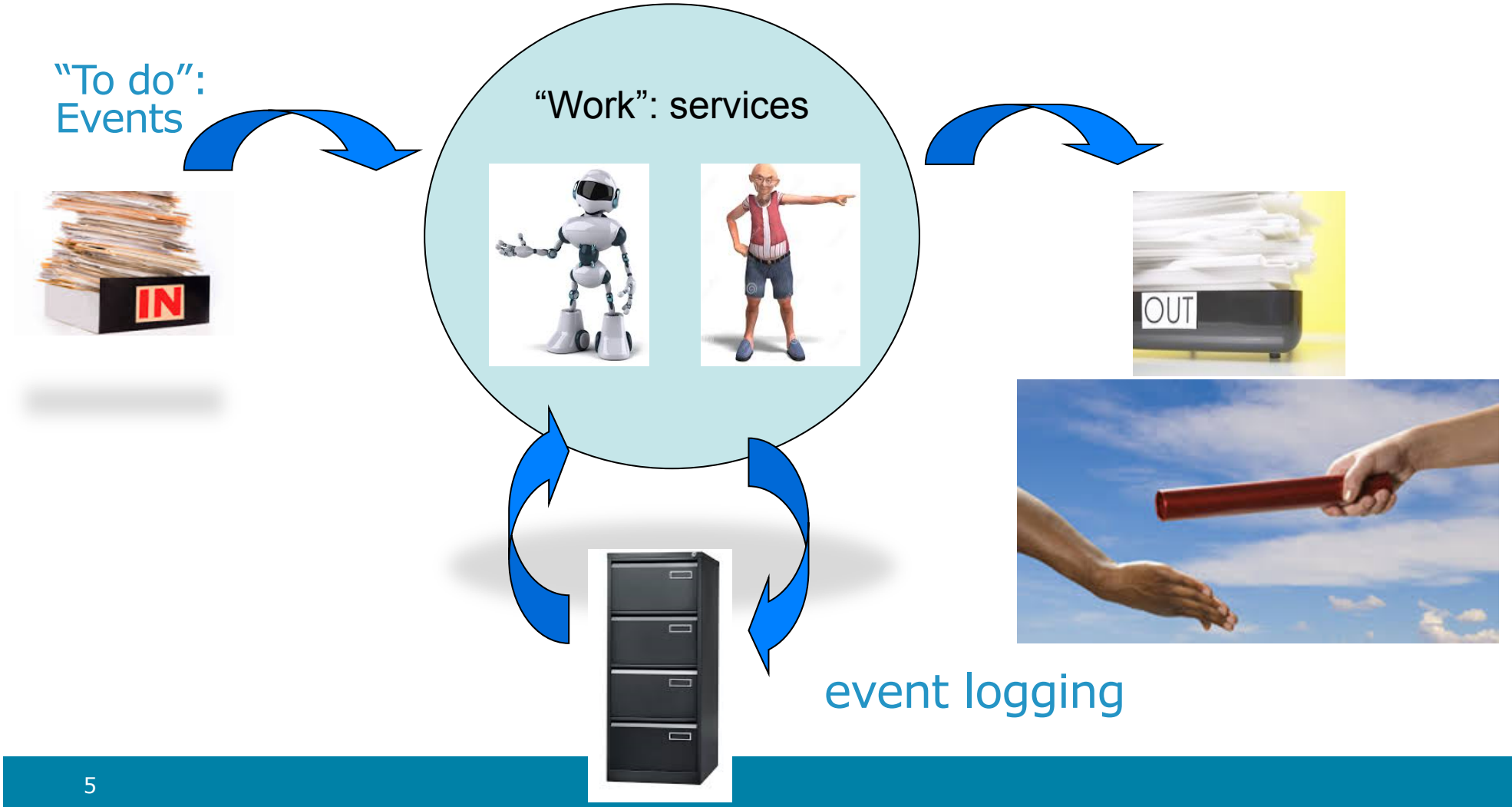
"Before"

"Seeing is believing"

"After"

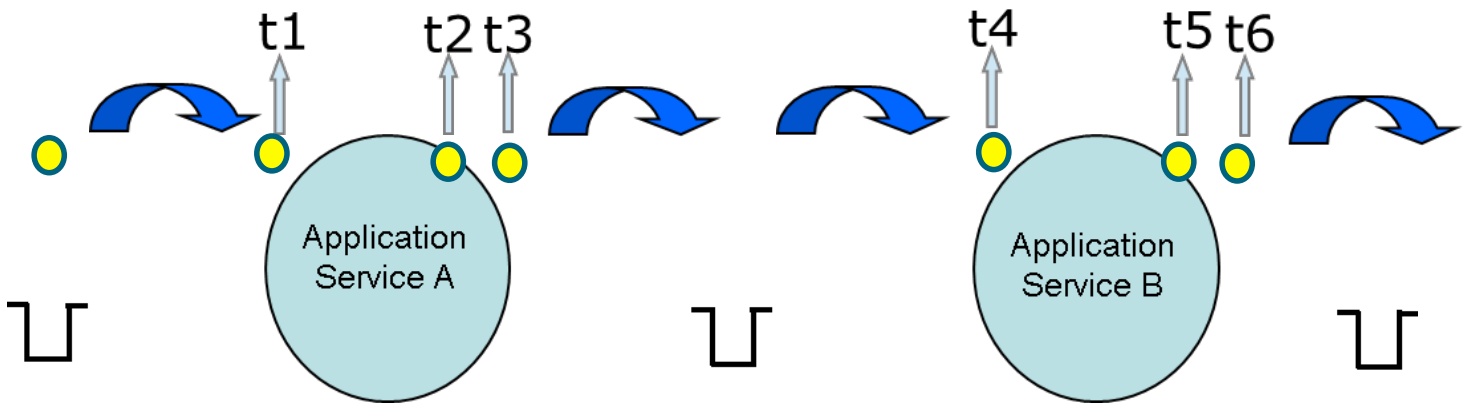
"How do we get a grip on this? "

Event driven environment and event logging

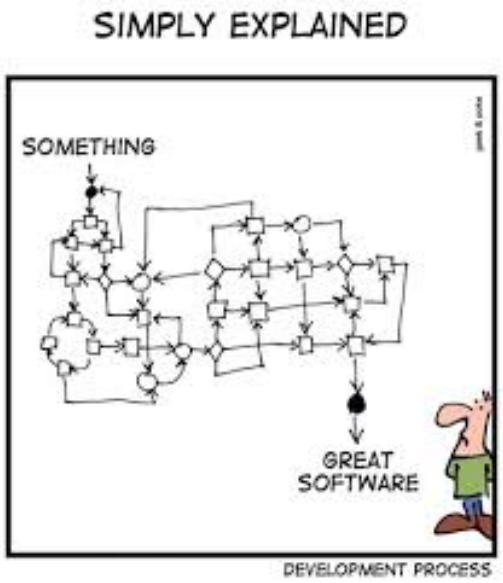


Event logging the student finance process

Date / Time	Application	Eventname	Event	T&T-id
t1	A	Recording Request (student)	Start consumption	123456
t2	A	Notifying (student)	Publication	123456
t3	A	Recording (student) Request	Eind consumption	123456
t4	B	Notifying (student)	Start consumption	123456
t5	B	Deciding Request (student)	Publicatie	123456
t6	B	Notifying (student)	Einde consumptie	123456



The challenge:



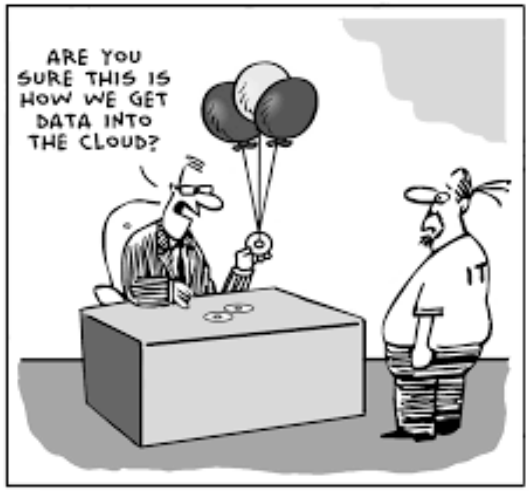
KPI's:

- Rate of straight through processing (no manually intervention)
- Speed of this STP
- Cases with manually processing
- Cases in error (interference)
- Performance of notification to customer
- Performance of decision on a transactions
- Impact of waiting time

Besides, learning on the job.

Tackling the challenge:

Or: the quest of finding a project approach



1: Creating process log layout

Date / Time	Application	Eventname	Event	T&T-id
t1	A	“IT name event 1”	Start consumption	123456
t2	A	“IT name event 2”	Publication	123456
t3	A	“IT name event 1”	Eind consumption	123456
t4	B	“IT name event 3”	Start consumption	123456
t5	B	“IT name event 4”	Publicatie	123456
t6	B	“IT name event 3”	Einde consumptie	123456

Start Date / Time	End Date / Time	Resource	Activity	Event	Action	T&T-id

2: Creating names with business logic

Date / Time	Application	Eventname	Event	T&T-id
t1	A	“IT name event 1”	Start consumption	123456
t2	A	“IT name event 2”	Publication	123456
t3	A	“IT name event 1”	Eind consumption	123456
t4	B	“IT name event 3”	Start consumption	123456
t5	B	“IT name event 4”	Publicatie	123456
t6	B	“IT name event 3”	Einde consumptie	123456

Start Date / Time	End Date / Time	Resource	Activity	Event	Action	T&T-id
		Studentfinance	Recording Request			123456
		Notifier	Etc..			123456

3: Creating “consume” activities

Date / Time	Application	Eventname	Event	T&T-id
t1	A	“IT name event 1”	Start consumption	123456
t2	A	“IT name event 2”	Publication	123456
t3	A	“IT name event 1”	Eind consumption	123456
t4	B	“IT name event 3”	Start consumption	123456
t5	B	“IT name event 4”	Publicatie	123456
t6	B	“IT name event 3”	Einde consumptie	123456

Start Date / Time	End Date / Time	Resource	Activity	Event	Action	T&T-id
t1	t3	Studentfinance	Request recorded	Consume	Studentfinance **ready with** Request recorded	123456
t4	t6	Notifier	Notification processed	Consume	Notifier **ready with** Notification processed	123456

4: Creating “publish” activities

Date / Time	Application	Eventname	Event	T&T-id
t1	A	“IT name event 1”	Start consumption	123456
t2	A	“IT name event 2”	Publication	123456
t3	A	“IT name event 1”	Eind consumption	123456
t4	B	“IT name event 3”	Start consumption	123456
t5	B	“IT name event 4”	Publicatie	123456
t6	B	“IT name event 3”	Einde consumptie	123456

Start Date / Time	End Date / Time	Resource	Activity	Event	Action	T&T-id
t2	t2	Studentfinance	Request recorded	Publication	**Processing** Request recorded **caused** Notification processed	123456
t5	t5	Notifier	Notification processed	Publication	**Processing** Notification processed **Caused** …	123456

5: Creating “error” activities

Date / Time	Application	Eventname	Event	T&T-id
t1	A	“IT name event 1”	Start consumption	123456
t2	A	“IT name event 1”	Start consumption	123456
t3	A	“IT name event 1”	Start consumption	123456
t4	B	“IT name event 2”	Start consumption	123456
t5	B	“IT name event 3”	Publicatie	123456
t6	B	“IT name event 2”	Einde consumptie	123456

Start Date / Time	End Date / Time	Resource	Activity	Event	Action	T&T-id
t1	t3	Studentfinance	Recording Request	error	Studentfinance **caused error in** Recording Request	123456

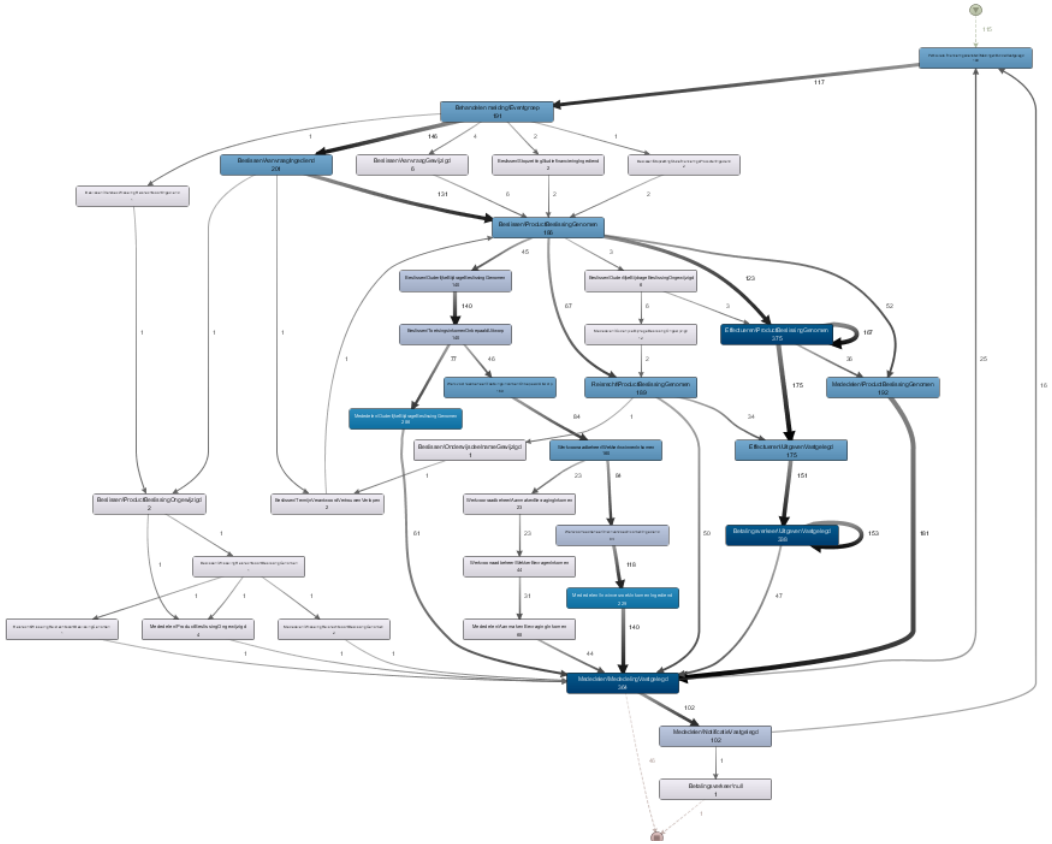
6: Creating “processed” activities

Date / Time	Application	Eventname	Event	T&T-id
t1	A	“IT name event 1”	Start consumption	123456
t2	A	“IT name event 2”	Publication	123456
t3	A	“IT name event 1”	End consumption	123456
t4	B	“IT name event 3”	Start consumption	123456
t5	B	“IT name event 4”	Publication	123456
t6	B	“IT name event 3”	End consumptie	123456

Start Date / Time	End Date / Time	Resource	Activity	Event	Action	T&T-id
t1	t1	Studentfinance	Recording Request	Processed	Studentfinance **Processing** Recording Request **Of** ..	123456
t2	t4	Notifier	Notification processed	Processed	Notifier **Processing** Notitication processed **Of** Recording Request	123456

7 : Preprocessing

8: Importing the process log into Disco



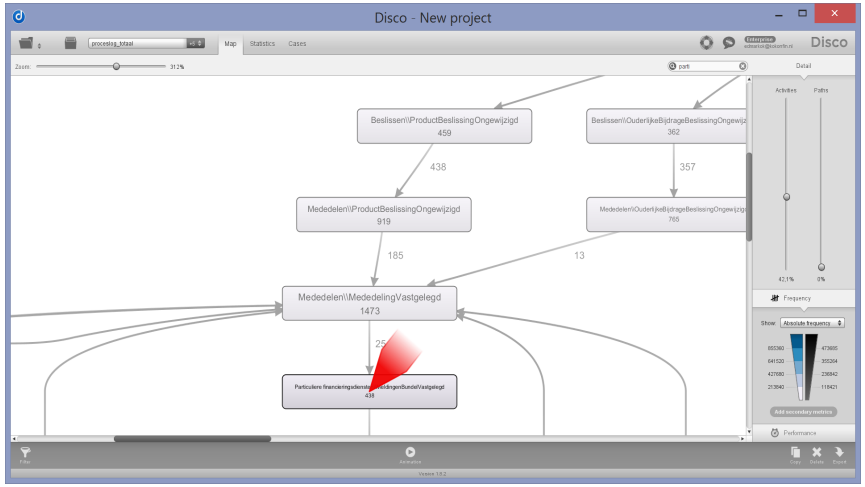
Events	2.589.564
Cases	994.486
Activities	95
Median case duration	0 millis
Mean case duration	77.7 mins
Start	09.01.2015 15:43:00
End	24.05.2015 20:13:00

9: Creating Disco recipes for each KPI

Examples of KPI's:

- Rate of straight through processing (no manual intervention)
- Speed of this STP

Step 1: filter target group



Events	2.589.564
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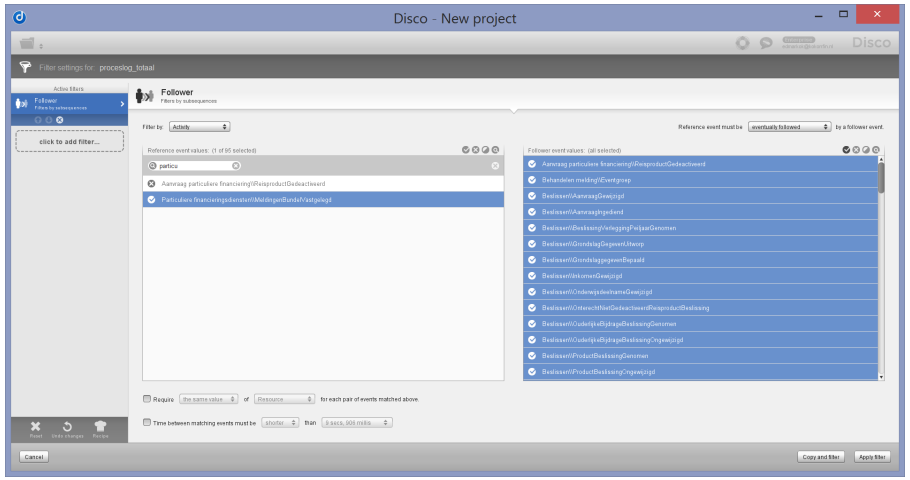
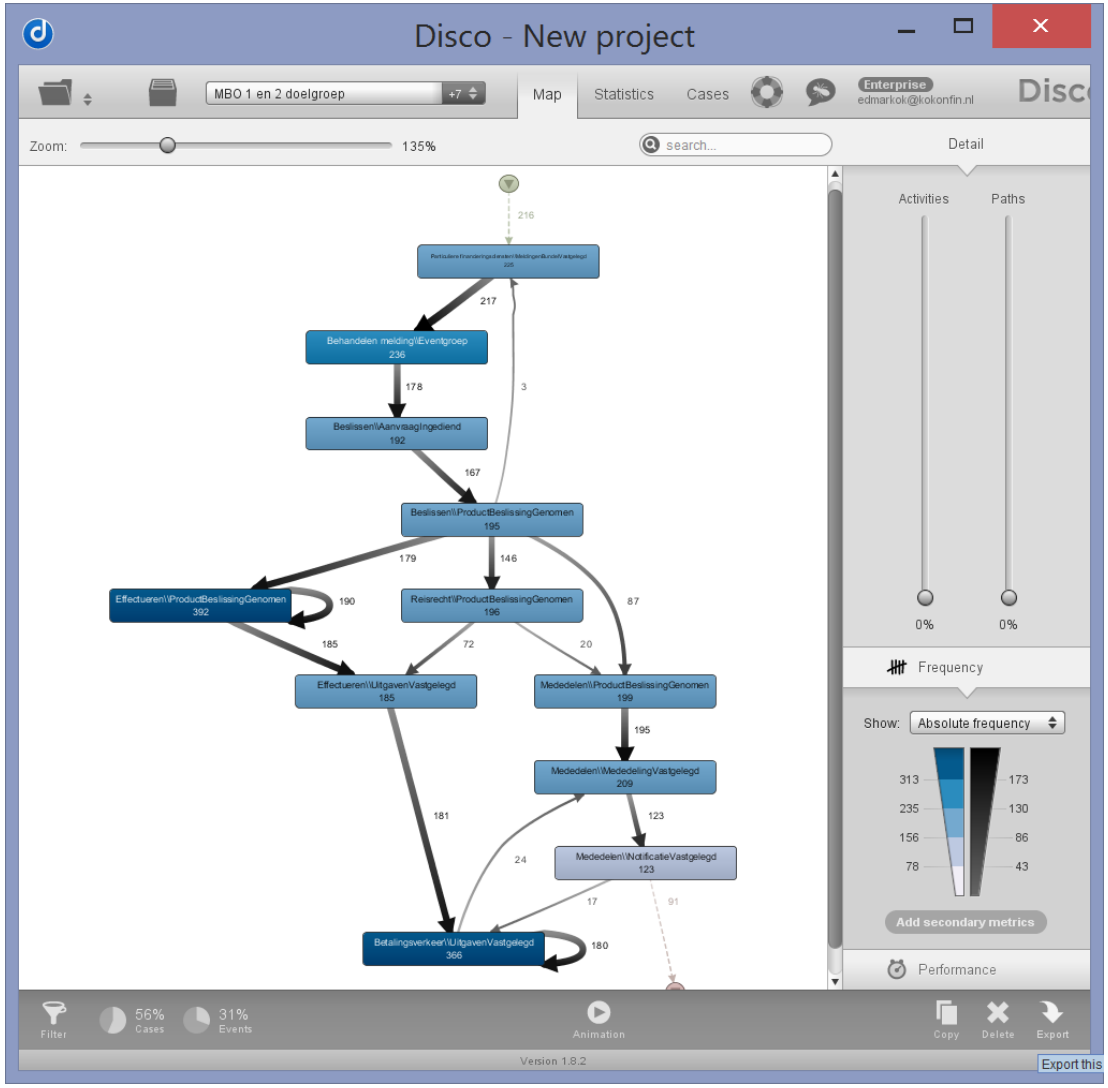
Start	09.01.2015 15:43:00
End	24.05.2015 20:13:00

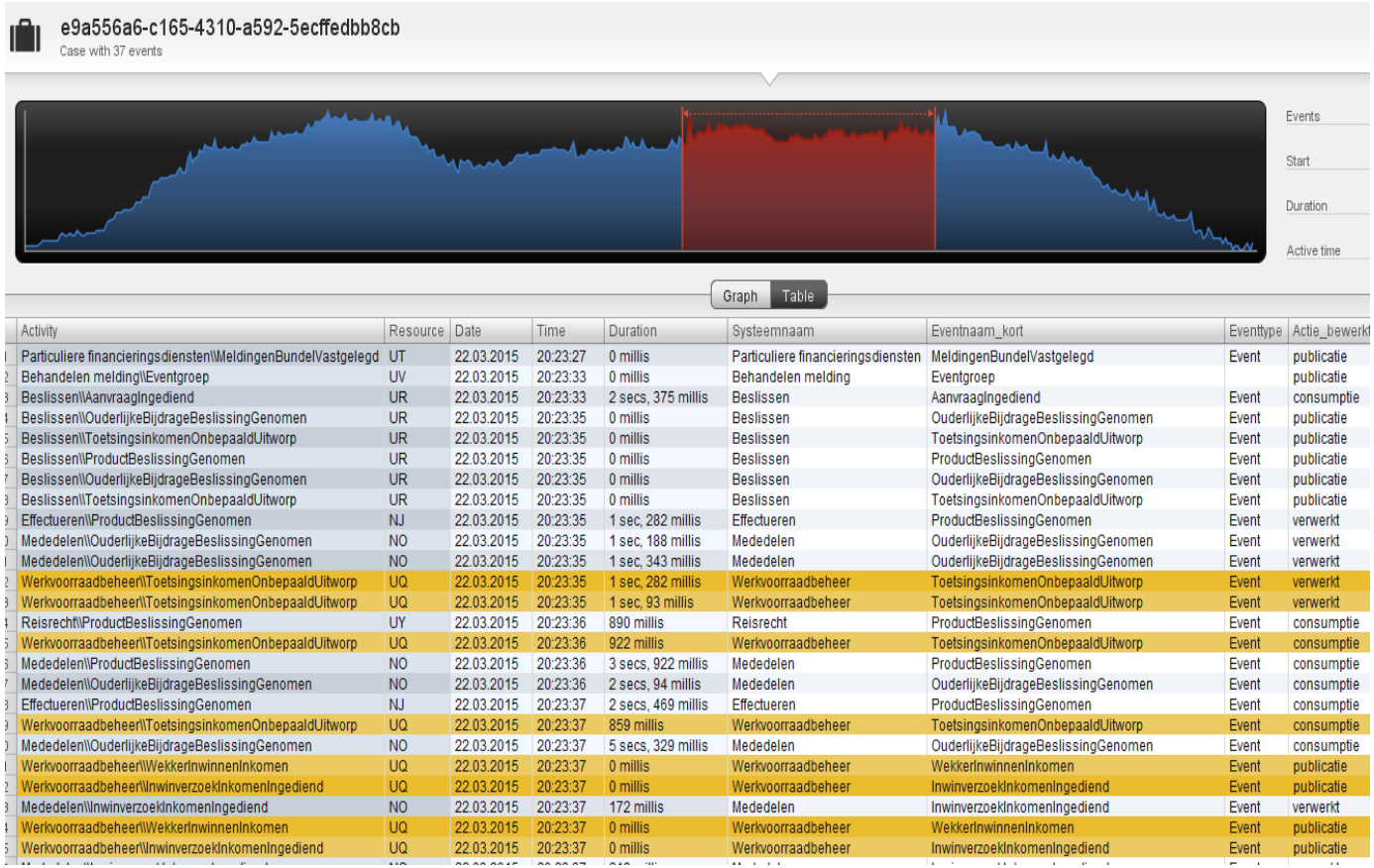


Events	9.000
Cases	399
Activities	50
Median case duration	25.5 secs
Mean case duration	11.1 d
Start	09.01.2015 16:34:44
End	24.05.2015 13:01:01

Process map result

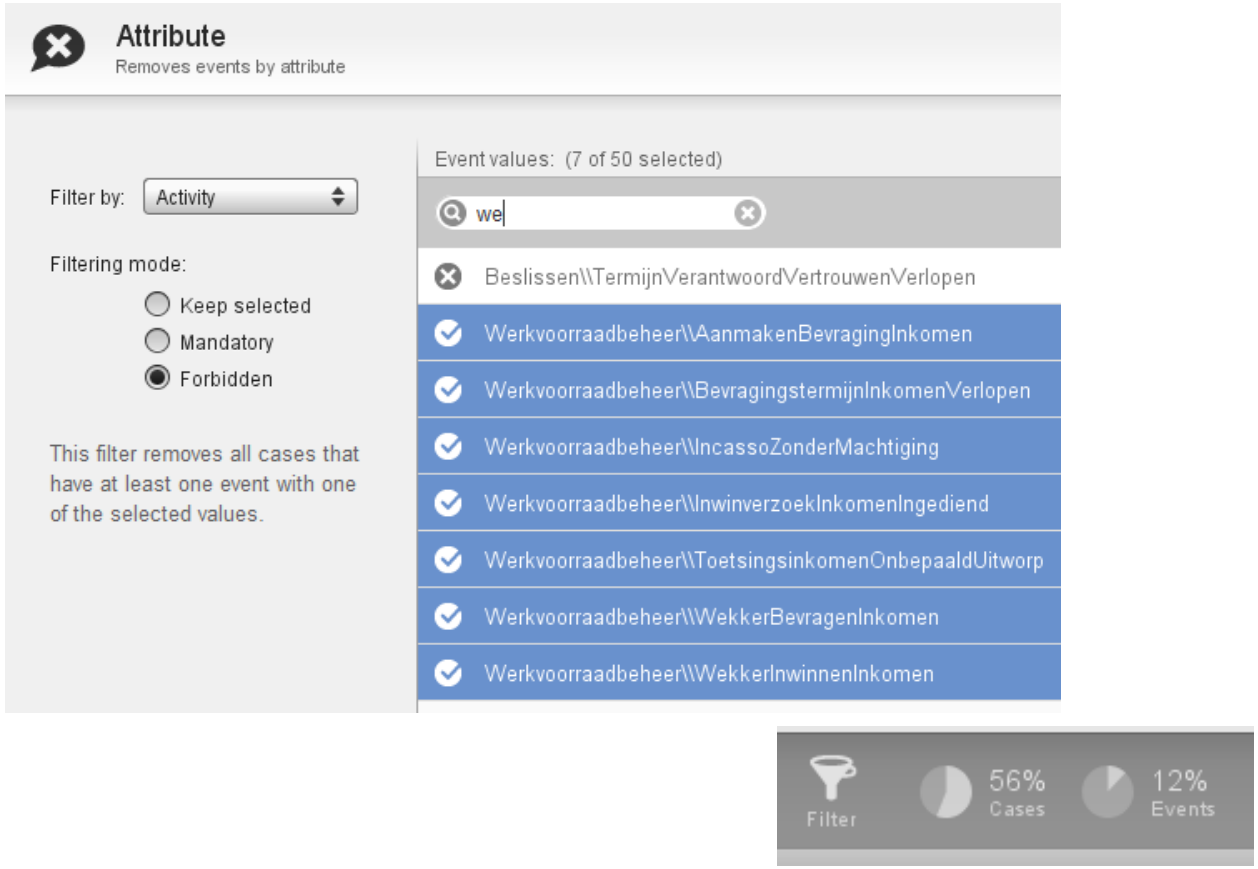


Step 2: exclude manual activities (1)



Activity	Resource	Date	Time	Duration	Systeemnaam	Eventnaam_kort	Eventtype	Actie_bewerkt
Particuliere financieringsdiensten\\MeldingenBundelVastgelegd	UT	22.03.2015	20:23:27	0 millis	Particuliere financieringsdiensten	MeldingenBundelVastgelegd	Event	publicatie
Behandelen melding\\Eventgroep	UV	22.03.2015	20:23:33	0 millis	Behandelen melding	Eventgroep		publicatie
Beslissen\\AanvraagIngediend	UR	22.03.2015	20:23:33	2 secs, 375 millis	Beslissen	AanvraagIngediend	Event	consumptie
Beslissen\\OuderlijkeBijdrageBeslissingGenomen	UR	22.03.2015	20:23:35	0 millis	Beslissen	OuderlijkeBijdrageBeslissingGenomen	Event	publicatie
Beslissen\\ToetsingsinkomenOnbepaaldUitworp	UR	22.03.2015	20:23:35	0 millis	Beslissen	ToetsingsinkomenOnbepaaldUitworp	Event	publicatie
Beslissen\\ProductBeslissingGenomen	UR	22.03.2015	20:23:35	0 millis	Beslissen	ProductBeslissingGenomen	Event	publicatie
Beslissen\\OuderlijkeBijdrageBeslissingGenomen	UR	22.03.2015	20:23:35	0 millis	Beslissen	OuderlijkeBijdrageBeslissingGenomen	Event	publicatie
Beslissen\\ToetsingsinkomenOnbepaaldUitworp	UR	22.03.2015	20:23:35	0 millis	Beslissen	ToetsingsinkomenOnbepaaldUitworp	Event	publicatie
Effectueren\\ProductBeslissingGenomen	NJ	22.03.2015	20:23:35	1 sec, 282 millis	Effectueren	ProductBeslissingGenomen	Event	verwerkt
Mededelen\\OuderlijkeBijdrageBeslissingGenomen	NO	22.03.2015	20:23:35	1 sec, 188 millis	Mededelen	OuderlijkeBijdrageBeslissingGenomen	Event	verwerkt
Mededelen\\OuderlijkeBijdrageBeslissingGenomen	NO	22.03.2015	20:23:35	1 sec, 343 millis	Mededelen	OuderlijkeBijdrageBeslissingGenomen	Event	verwerkt
Werkvoorraadbeheer\\ToetsingsinkomenOnbepaaldUitworp	UQ	22.03.2015	20:23:35	1 sec, 282 millis	Werkvoorraadbeheer	ToetsingsinkomenOnbepaaldUitworp	Event	verwerkt
Werkvoorraadbeheer\\ToetsingsinkomenOnbepaaldUitworp	UQ	22.03.2015	20:23:35	1 sec, 93 millis	Werkvoorraadbeheer	ToetsingsinkomenOnbepaaldUitworp	Event	verwerkt
Reisrecht\\ProductBeslissingGenomen	UY	22.03.2015	20:23:36	890 millis	Reisrecht	ProductBeslissingGenomen	Event	consumptie
Werkvoorraadbeheer\\ToetsingsinkomenOnbepaaldUitworp	UQ	22.03.2015	20:23:36	922 millis	Werkvoorraadbeheer	ToetsingsinkomenOnbepaaldUitworp	Event	consumptie
Mededelen\\ProductBeslissingGenomen	NO	22.03.2015	20:23:36	3 secs, 922 millis	Mededelen	ProductBeslissingGenomen	Event	consumptie
Mededelen\\OuderlijkeBijdrageBeslissingGenomen	NO	22.03.2015	20:23:36	2 secs, 94 millis	Mededelen	OuderlijkeBijdrageBeslissingGenomen	Event	consumptie
Effectueren\\ProductBeslissingGenomen	NJ	22.03.2015	20:23:37	2 secs, 469 millis	Effectueren	ProductBeslissingGenomen	Event	consumptie
Werkvoorraadbeheer\\ToetsingsinkomenOnbepaaldUitworp	UQ	22.03.2015	20:23:37	859 millis	Werkvoorraadbeheer	ToetsingsinkomenOnbepaaldUitworp	Event	consumptie
Mededelen\\OuderlijkeBijdrageBeslissingGenomen	NO	22.03.2015	20:23:37	5 secs, 329 millis	Mededelen	OuderlijkeBijdrageBeslissingGenomen	Event	consumptie
Werkvoorraadbeheer\\WekkerInwinnenInkomen	UQ	22.03.2015	20:23:37	0 millis	Werkvoorraadbeheer	WekkerInwinnenInkomen	Event	publicatie
Werkvoorraadbeheer\\InwinverzoekInkomenIngediend	UQ	22.03.2015	20:23:37	0 millis	Werkvoorraadbeheer	InwinverzoekInkomenIngediend	Event	publicatie
Mededelen\\InwinverzoekInkomenIngediend	NO	22.03.2015	20:23:37	172 millis	Mededelen	InwinverzoekInkomenIngediend	Event	verwerkt
Werkvoorraadbeheer\\WekkerInwinnenInkomen	UQ	22.03.2015	20:23:37	0 millis	Werkvoorraadbeheer	WekkerInwinnenInkomen	Event	publicatie
Werkvoorraadbeheer\\InwinverzoekInkomenIngediend	UQ	22.03.2015	20:23:37	0 millis	Werkvoorraadbeheer	InwinverzoekInkomenIngediend	Event	publicatie

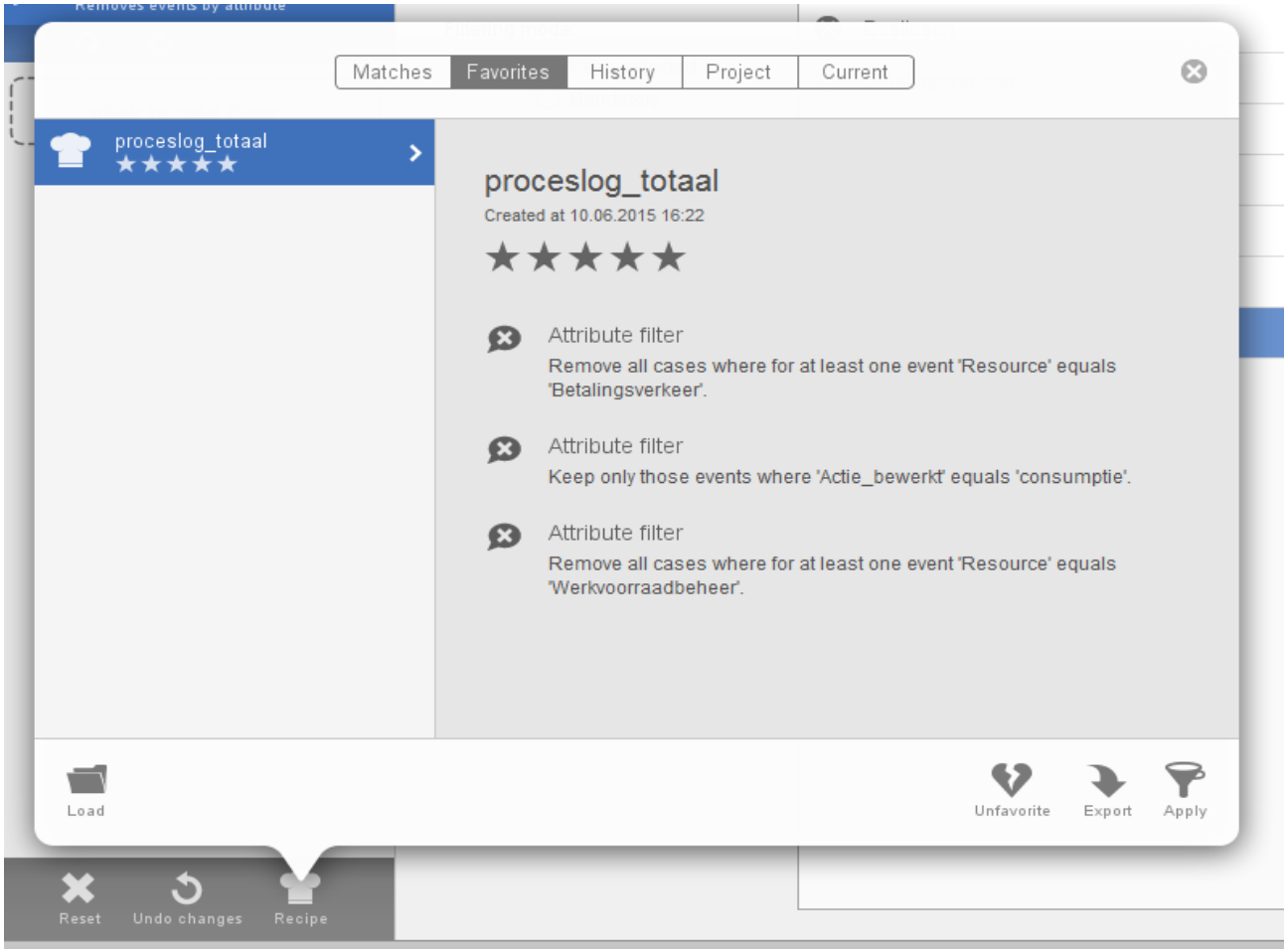
Step 2: exclude manual activities (2)



Events	3.345
Cases	398
Activities	32
Median case duration	15 secs
Mean case duration	11.1 d
Start	09.01.2015 16:34:48
End	24.05.2015 13:01:01

Events	2.796
Cases	225
Activities	32
Median case duration	17 secs
Mean case duration	15.7 hrs
Start	09.01.2015 16:34:44
End	23.05.2015 20:30:24

Step 3: Save & run the recipe!



KPI examples outcome (1)

Example 1:

- Rate of straight through processing (no manually intervention) : 80%

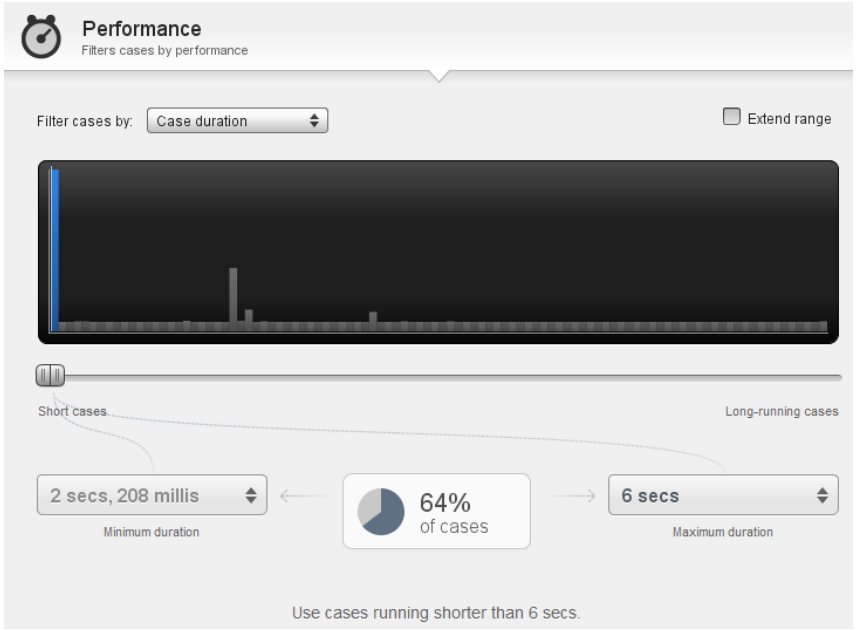
Events	3.345
Cases	398
Activities	32

Events	1.089
Cases	224
Activities	21

KPI examples outcome (2)

Example 2:

- Median speed of this STP : 10 seconds …?



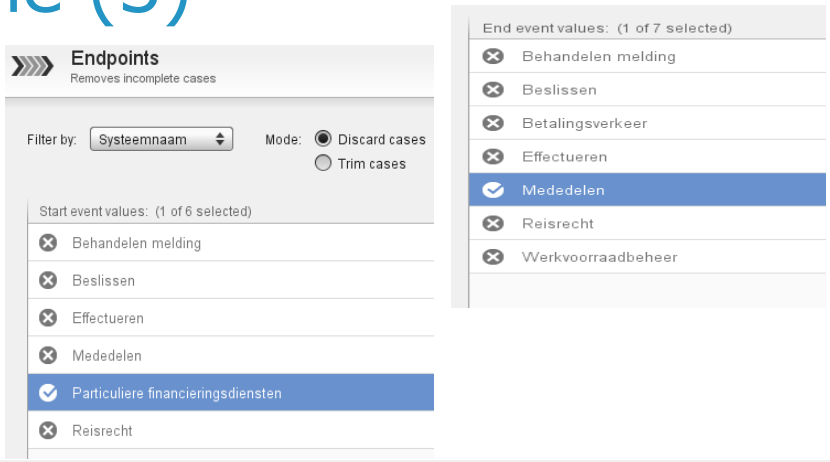
Events	1.089
Cases	224
Activities	21
Median case duration	10 secs
Mean case duration	15.4 hrs
Start	09.01.2015 16:34:48
End	23.05.2015 20:30:24

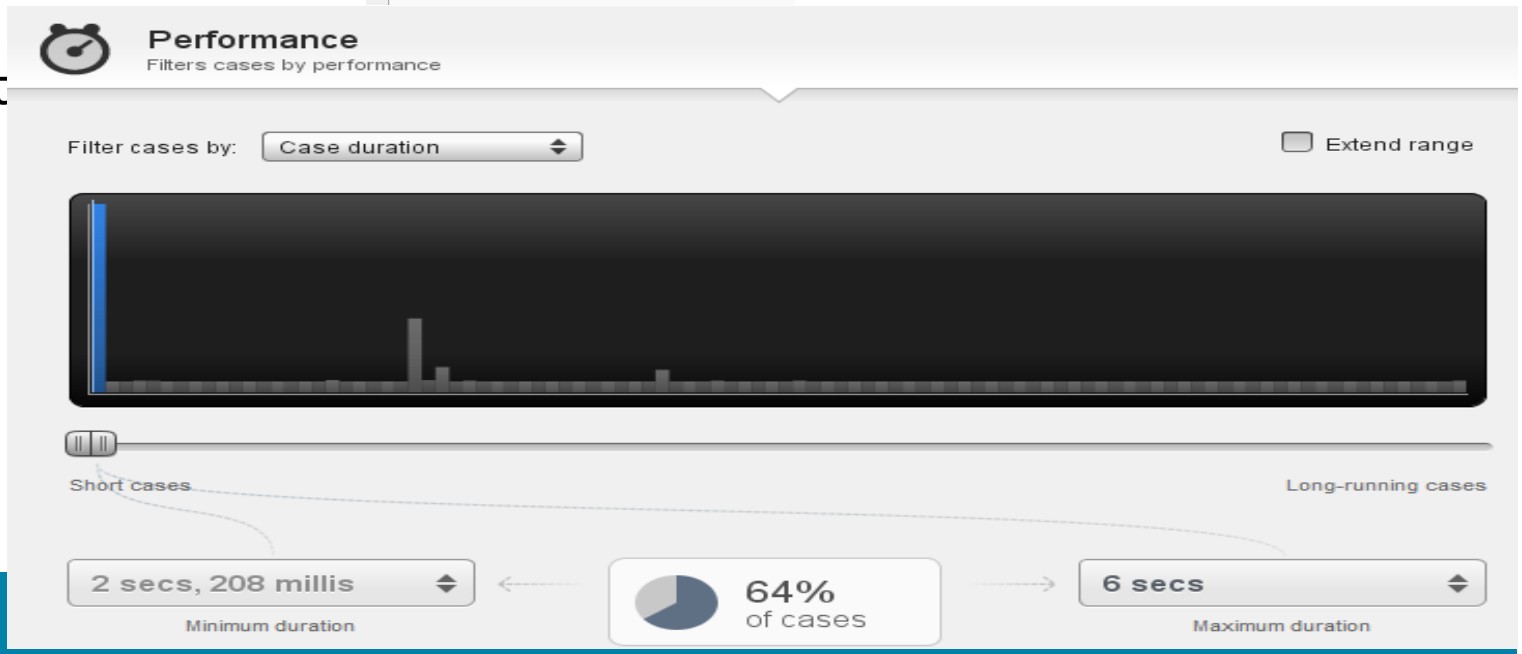
Checking all cases with performance filter : 64% of cases < 6 sec.

KPI examples outcome (3)

Example 3:

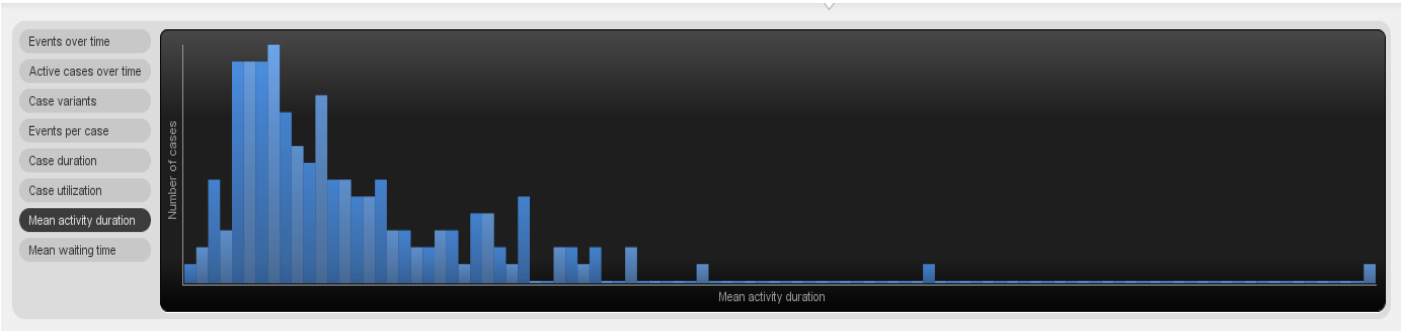
- Mean Performance Rate between "Recording Request" and "Notification t customer"

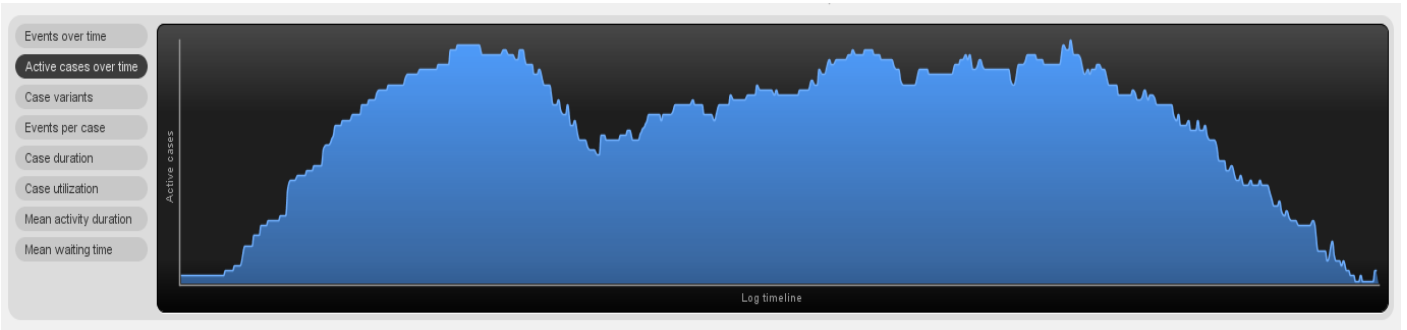




That’s all?

Where ‘s the 10th step?



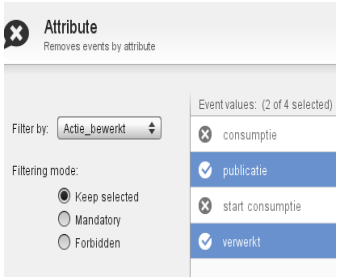


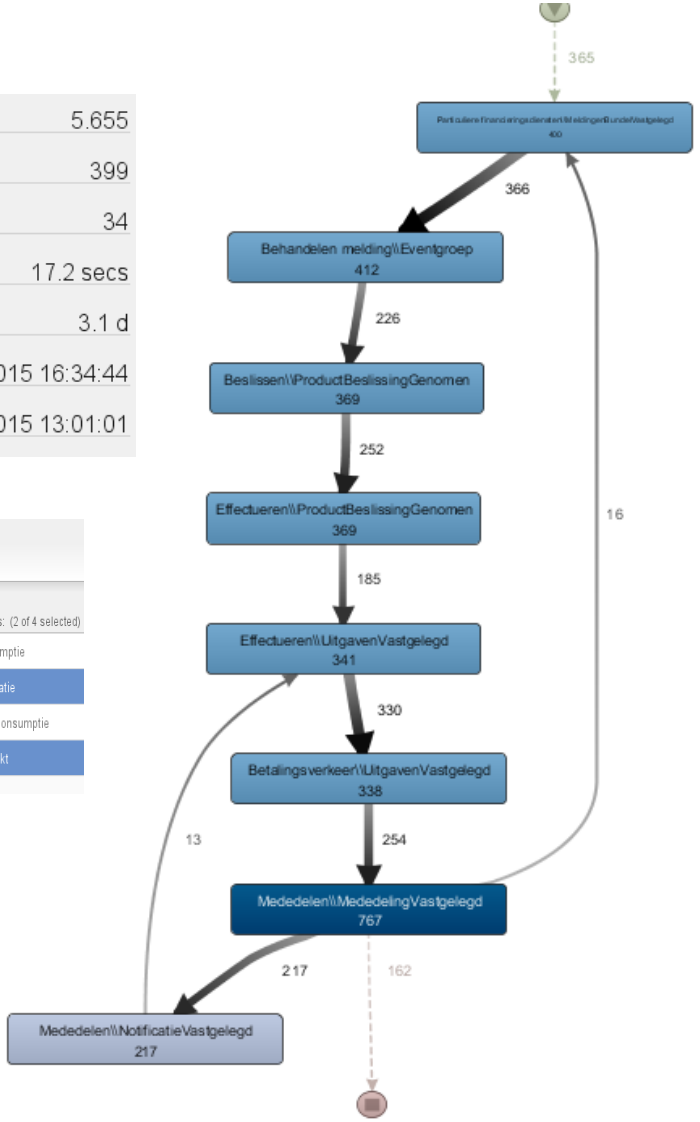
Activity	▲ Frequency	Relative frequency	Median duration	Mean duration	Duration range
Werkvoorraadbeheer\\ToetsingsinkomenOnbepaaldUitworp	278	46,26 %	828 millis	1 sec, 176 millis	11 secs, 453 millis
Werkvoorraadbeheer\\WekkerInwinnenInkomen	266	44,26 %	1 sec, 258 millis	2 secs, 195 millis	25 secs, 829 millis
Werkvoorraadbeheer\\WekkerBevragenInkomen	55	9,15 %	1 sec, 312 millis	2 secs, 265 millis	9 secs, 31 millis
Werkvoorraadbeheer\\IncassoZonderMachtiging	2	0,33 %	1 sec, 164 millis	1 sec, 164 millis	922 millis

..Check..Act..

Using “publish” and “ready” events to create another process view on the process log

Events	5.655
Cases	399
Activities	34
Median case duration	17.2 secs
Mean case duration	3.1 d
Start	09.01.2015 16:34:44
End	24.05.2015 13:01:01





Some lessons learned..

A lean proceslog vs event log with all kind of attributes?
Is it a business process or an IT process?
Are EDA to discover with process mining?
Is this the only way to discover KPI’s out of a EDA?
Pretty complex code for our dasboard tooling?
Process mining is not a reporting tool.
Measuring and reporting is just a start.

..Others like Customer Journey mining, but that’s another story!

Questions?

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Linkedin : business analytics, process mining, & lean six sigma groups