

IBM Cloud Pak for Automation: Process Mining

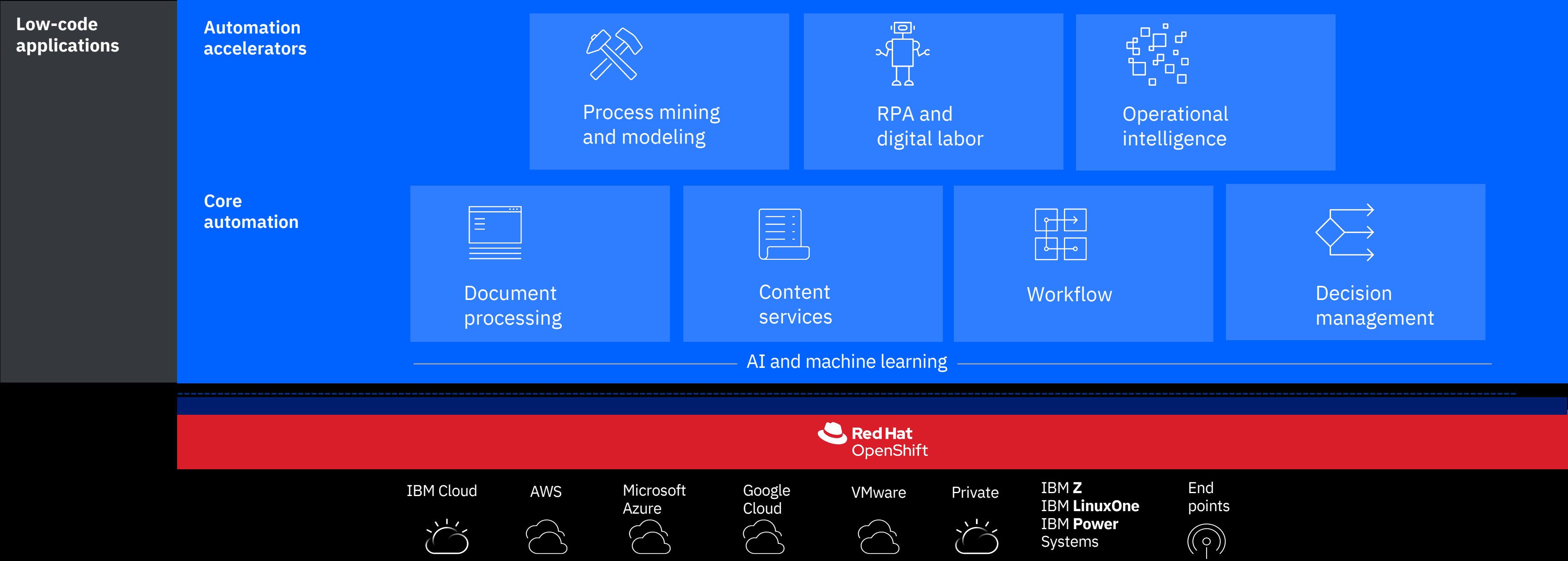
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Hybrid Cloud Build Team
IBM



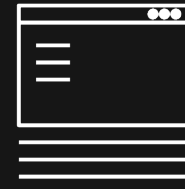
IBM Cloud Pak for Business Automation

Client and partner solutions



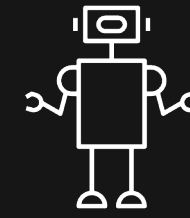
IBM Cloud Pak for Business Automation: Accelerators

Start with your
highest priority
projects and
easily expand
as needs evolve



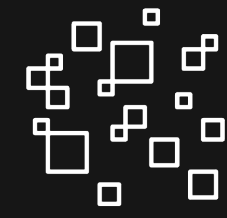
Process mining and modeling

Quickly understand your
as-is processes to pinpoint
inefficiencies and bottlenecks so
that you have confidence
you are automating the areas
of highest priority



Robotic Process Automation (RPA)

Augment your workforce
with digital employees to
free humans for higher-
value work and innovation



Operational Intelligence

Gain insights with built-in AI
that provides recommended
actions for continuous
optimization

Without Process Mining...

Traditionally up to

70%

of automation resources
are spent pre-automation.

Business analysts rely on interviews, estimates, post-its, reports, opinions, theoretical maps to identify bottlenecks, durations, errors, non-compliance activities.

That can lead companies to **miss important issues**, or to **focus too much attention** on problems that occur infrequently and cost the business little.

Significant automation development costs are engaged without a clear understanding of their impact and ROI.

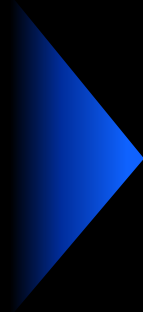
With Process Mining...

Business analysts and process stakeholders:

Rely on facts and intuitive visualizations to **rapidly and accurately**

Plan most **efficient automations**

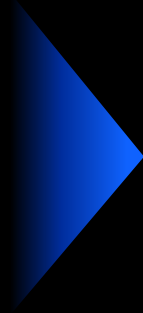
Continuously **improve**



Discover end-to-end processes and identify bottlenecks to ultimately quantify process improvement benefits



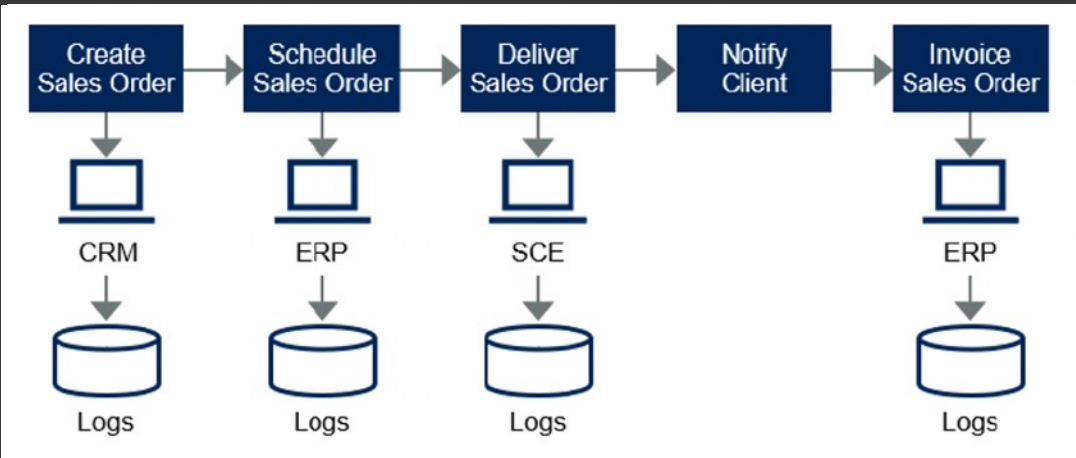
Simulate process enhancements and clarify potential ROI



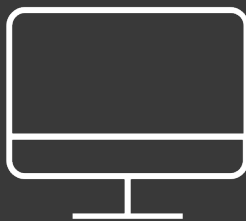
Monitor and optimize processes to result in higher velocity, higher automation

Understand real work done by employees to improve business efficiency

Data: Logs from information systems



Data: User's desktop recordings



Extract



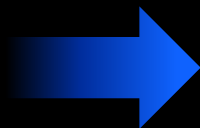
Task mining



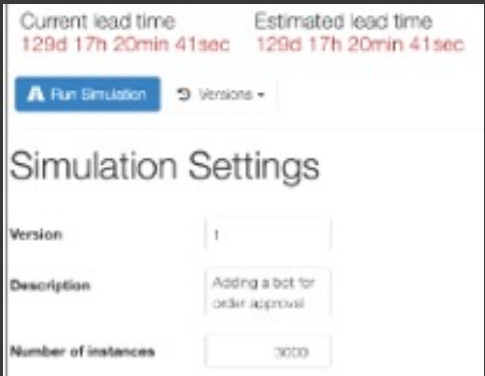
Event logs (Data sources)

7/14/2011 6:20	7/14/2011 6:20	Authorize Client's Invoice Payment	748	Tina Janssens	Financial Manager
7/14/2011 6:38	7/14/2011 6:52	Pay Invoice	748	Annemie Van Ginneken	Financial Manager
11/20/2017 0:20	11/20/2017 0:29	Create Inquiry Request	152	Karin Gielen	RES
11/20/2017 23:11	11/20/2017 23:18	Analyze Inquiry Request	152	Jef Konings	RES Manager
11/20/2017 23:20	11/20/2017 23:24	Create Inquiry Proposal RES Manager	152	Rudy Schrauwen	RES Manager
11/23/2017 6:28	11/23/2017 6:49	Analyze Inquiry Proposal	152	Kris Cassauwers	Purchasing Agent
11/23/2017 7:38	11/23/2017 7:45	Amend Inquiry Proposal	152	Rudy Schrauwen	RES Manager

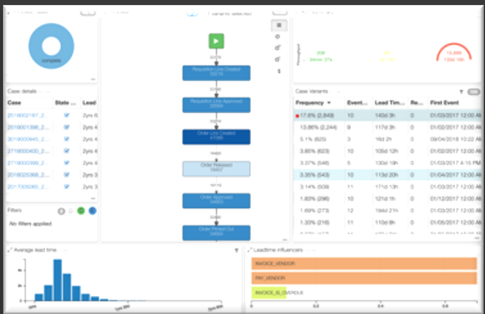
Process mining



Digital Twin



Analytics

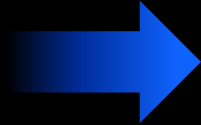


Discovery

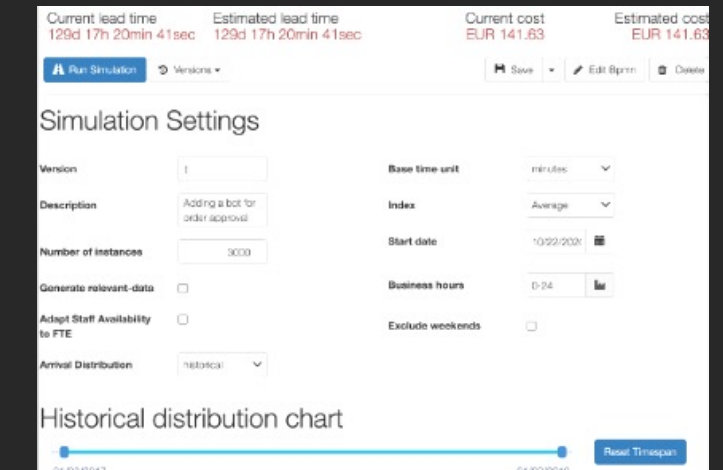
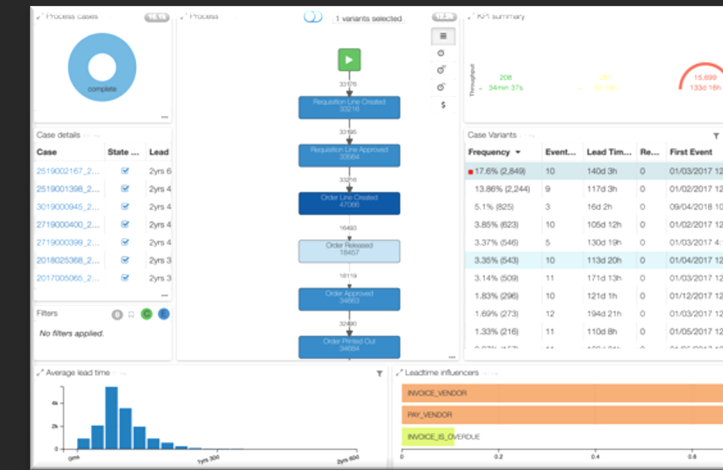
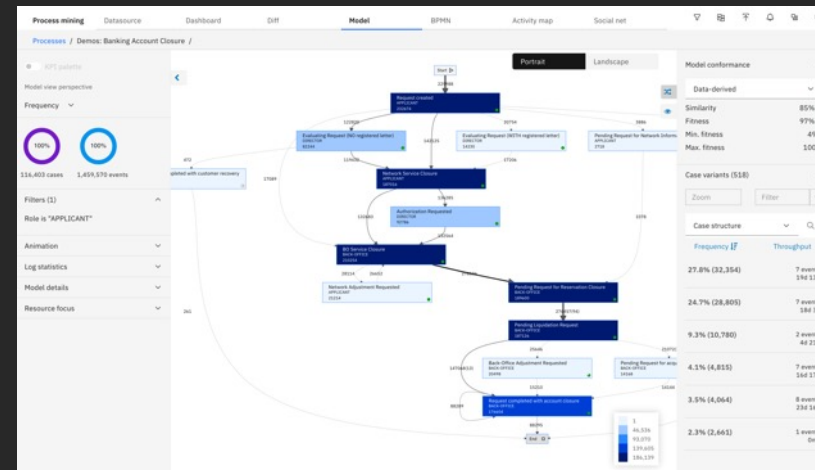


Scope:
Actual work done by employees

Automate



Process Mining steps



Discovery

Automated algorithms for:

- Process Discovery
- Task Mining
- Business Rules Mining
- Multi-level Process Mining

Analytics

Dashboards and event flows for:

- KPI and cost checking
- Compliance checking
- Automation outcomes
- Root cause analysis

Digital Twin

Create a Digital Twin to:

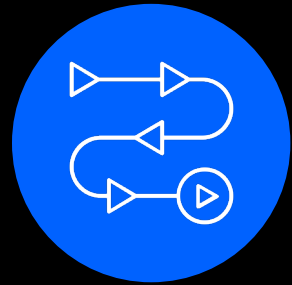
- Study what-if scenarios
- Simulate improvements
- Calculate ROI

Automation connection points with Process Mining

Blueworks Live	Workflow	RPA	Decisions	BAI
Export BPMN and run simulations to reach business goals	Export BPMN and run simulations to reach business goals	Get bot recommendations from Task Mining based on expected automation level and bot complexity	Create decisions based on DMN decision tables mined with Rules Mining	Export events to Process Mining to improve processes and cases
Export reference BPMN and check conformance of actual cases	Export reference BPMN and check conformance of actual cases	Simulate business impact of implementing bots before engaging costs		Export events to Process Mining to predict running cases evolution and metrics
Import generated BPMN and model reference processes	Export Workflow events to improve and simulate processes and cases			
	Import generated BPMN and implement workflows			

Process Mining journey

The Process Mining journey



1

Process setup

Scope of the analysis,
data extraction

2

Process Mining

Events log

- Frequency view, performance view, costs
- Path and deviations analysis
- Lead time influencers, SNA, activity map

3

Task Mining

User actions recording

- Automated analysis of steps execute by users to perform process activities (Tasks)
- RPA candidates

4

Compliance

Define Reference Model (BPMN)

- Violations and root cause analysis
- Segregation of duties

5

Automation analysis

Define standard costs

- As-is automation and candidate tasks for automation

6

KPI and performance

Define KPIs

- Verify standard/custom KPI's compliance
- Process compare and best practices

7

Simulation

Scenarios and goals definition

- Simulate what-if scenarios
- Compare as-is and to-be
- Compute automation ROI

8

Real-time and predictive analytics

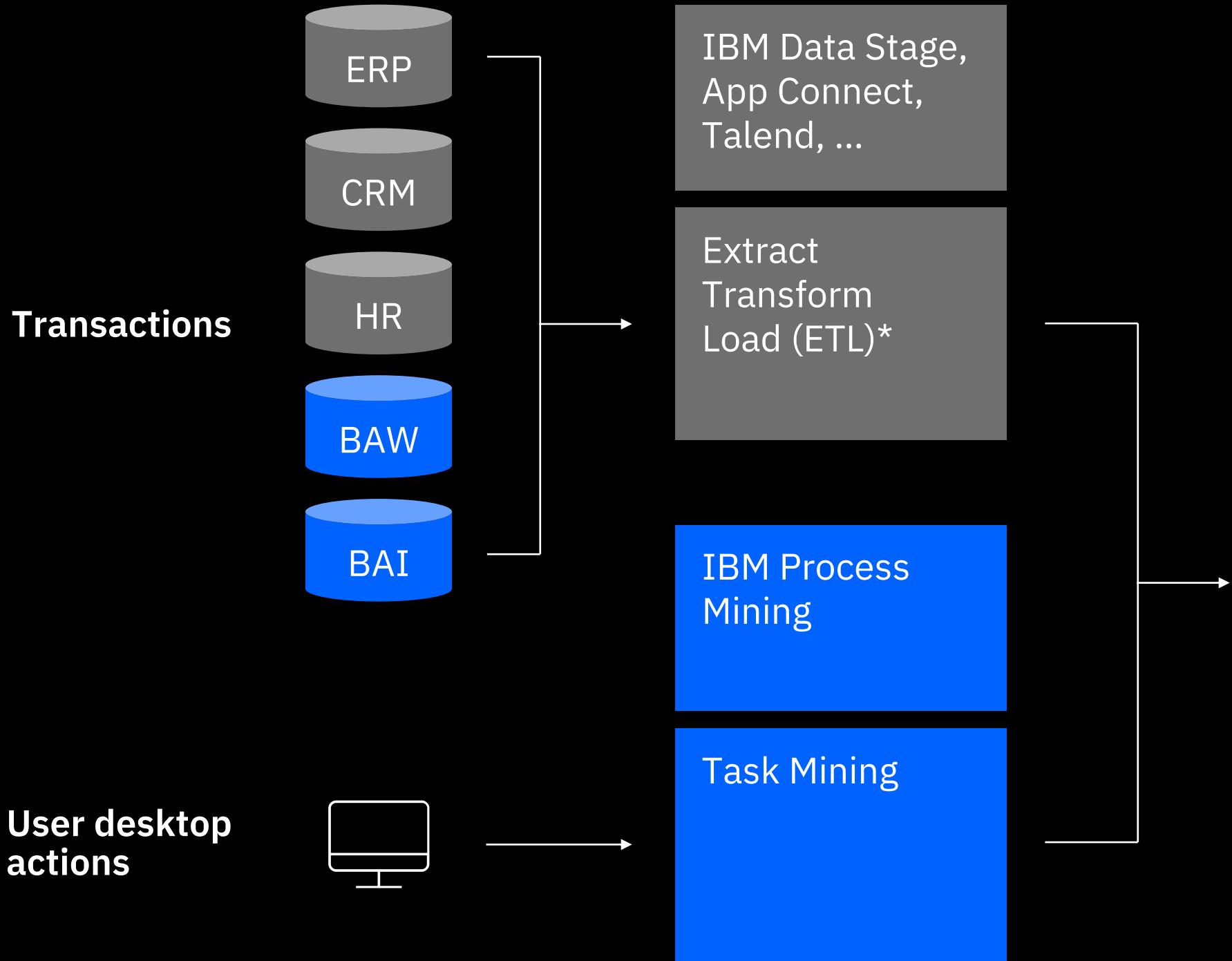
- Real time monitoring of running cases
- Estimate lead time and costs

9

Automation plan

Select deviations to remove
Reduce non-compliance/reworks
Define new automation
Define new resource allocation

Data extraction and process setup



Data source, data mapping

1. Upload your data source

Raw or compressed (zip, gz) CSV or XES files, up to 2 GB.
A preview of the uploaded data will be displayed below.

Select data source file

Upload

Get from Simulation

1,460,674 rows in 2 of 2 data sources

☒ Append to existing

2. Upload the reference model
(if available)

XPDL2.1 compliant file (.XPDL)
To visualize differences and variations from the data derived model.

Select reference model file

Upload

Get from BPA

Source: banking-closing-account.xpdl

3. Map relevant data columns

First select the column, then assign the corresponding heading.
You can select up to 80 custom fields. Use the clear button to undo.

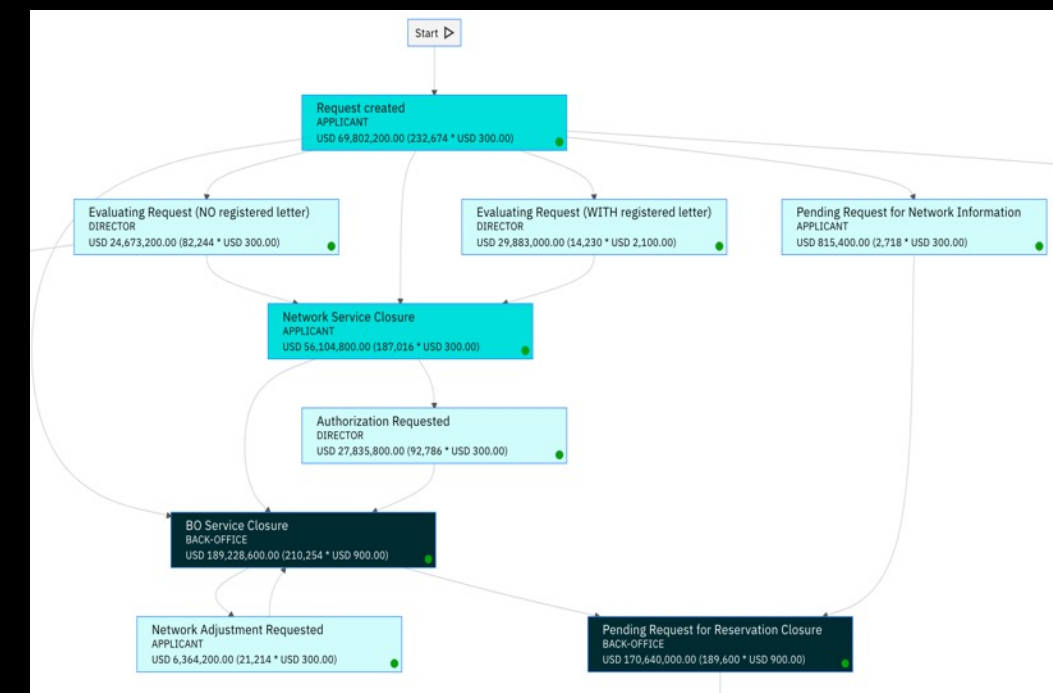
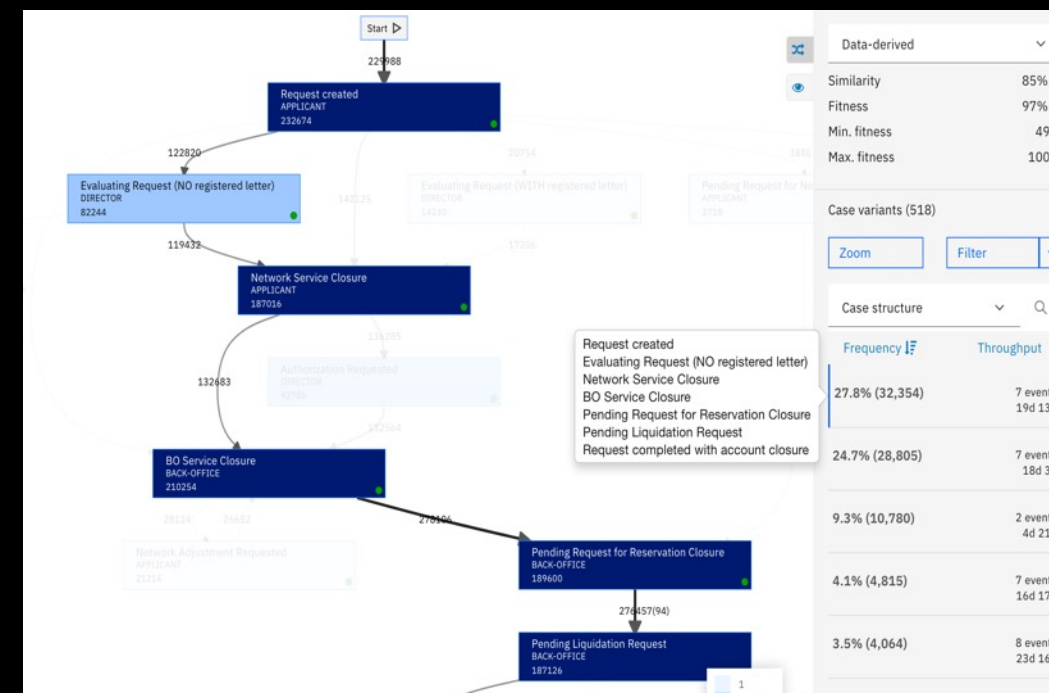
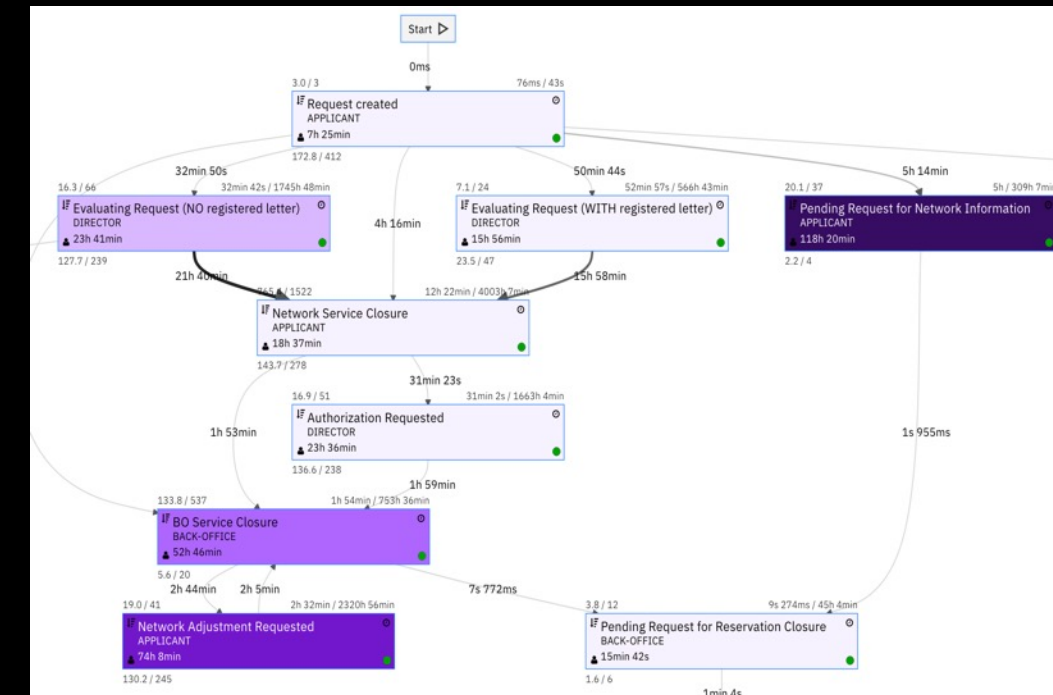
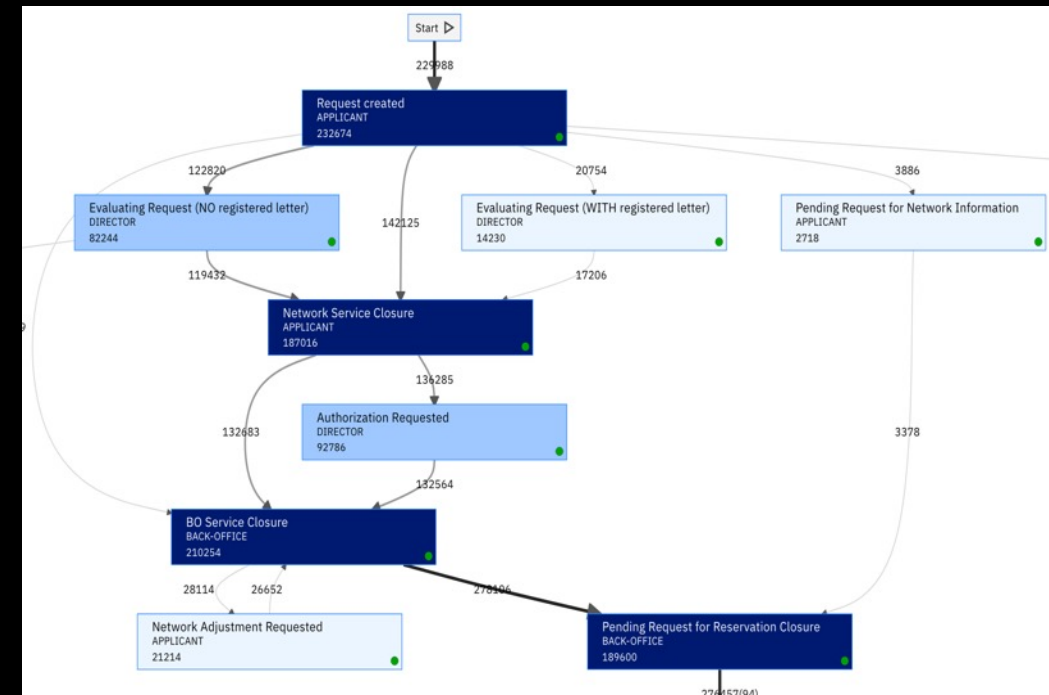
Visualize process

Process id	Activity	Start time	End time	Resource	Role	Custom fields	Clear all	
REQUEST_ID	ACTIVITY	START_DATE	END_DATE	CE_UO	ROLE	AUTOMATIC	CLOSURE_TYPE	CLOSURE_REASON
20174000013	Request completed with account closure	2017-04-20 13:22:20.000	2017-04-20 18:13:58.000	BOC	BACK-OFFICE	HUMAN		
20174000013	Back-Office Adjustment Requested	2017-04-20 18:13:58.000		BOC	BACK-OFFICE	HUMAN		
20174000016	Pending Request for Reservation Closure	2017-04-20 15:10:17.000	2017-04-20 15:10:17.000	BOC	BACK-OFFICE	HUMAN		
20174000016	Service closure Request with BO responsibility	2017-04-20 15:10:17.000	2017-04-20 15:10:17.000	BOC	BACK-OFFICE	HUMAN		
20174000016	Authorization Requested	2017-04-20 15:10:17.000	2017-04-20 15:10:17.000	00054	DIRECTOR	HUMAN		
20174000016	Network Adjustment Requested	2017-04-20 15:10:17.000	2017-04-20 15:10:17.000	00054	APPLICANT	HUMAN		
20174000016	Request completed with account closure	2017-04-20 15:10:17.000		BOC	BACK-OFFICE	HUMAN		
20174000016	Pending Liquidation Request	2017-04-20 15:10:17.000	2017-04-20 15:10:17.000	BOC	BACK-OFFICE	HUMAN		

*ETL contribution packages available for P2P/SAP and O2C/SAP

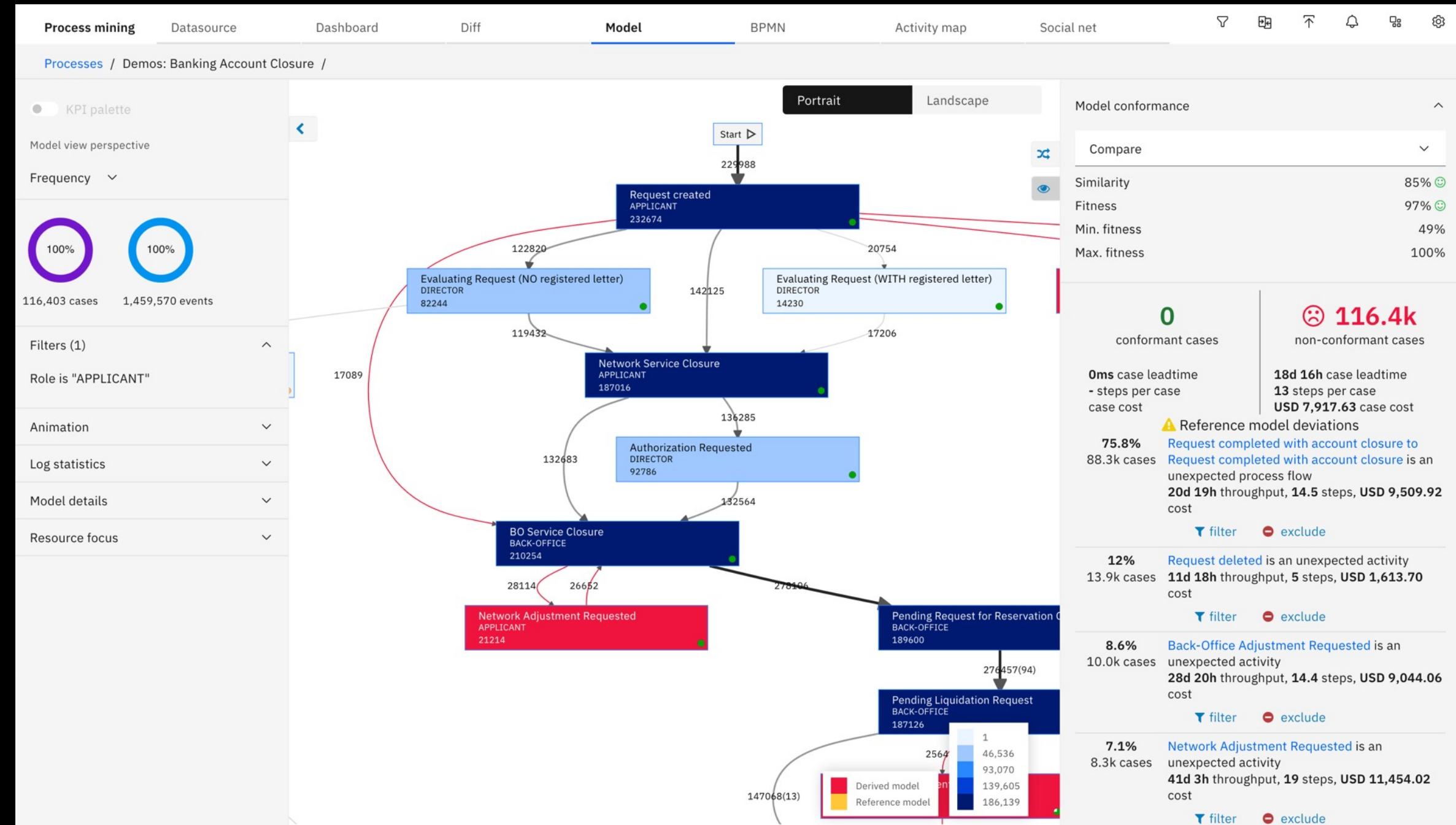
Discover frequencies, variants, reworks, durations, costs from real data

- Instantly visualize the real processes
- Most frequent activities, reworks, variants can be good automation candidate for **RPA** or **Workflow**
- Highest wait-time and durations show potential bottlenecks
- Identify costly activities based on resource cost



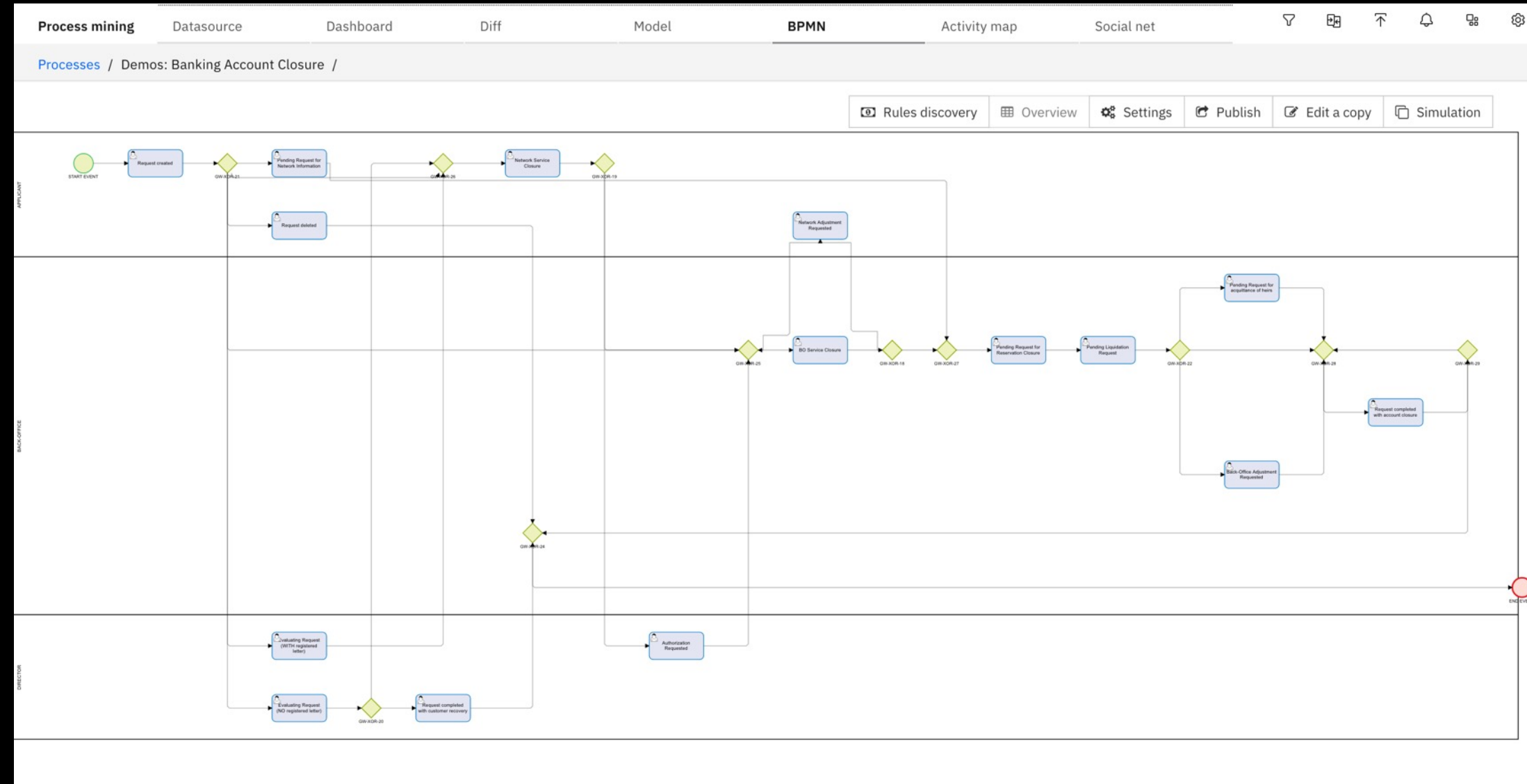
Check conformance with reference models

- Quickly identify non-conformant cases
- Import As-Designed BPMN reference models from [Blueworks Live](#) or from [Business Automation Workflow](#)
- Get cost of non-conformance, fitness level
- Get root-cause analysis



Generate BPMN from real processes

- BPMN model generated from events, filters can be applied (exclude running cases, exclude non-conformant cases, keep most frequent variant, etc.)
- Export BPMN to [Blueworks Live](#) for finer modelling
- Export BPMN to [Business Automation Workflow](#) for implementing workflows



Generate DMN decision tables from real processes with Rules Mining

- Rules Mining discovers the business logic behind the gateways
- Set the business data to consider, the details level
- Implement the business logic in [Operation Decision Manager](#) or [Automation Decision Services](#)

Rules overview ✕

Activity	Next Activities	Matching	Immigrants	Coverage	Emigrants	Precision
A_APPROVED Exclusive Gateway	A_REGISTERED	901	12	98.69%	527	63.10%
	O_ACCEPTED	17	527	3.13%	12	58.62%
A_DECLINED Exclusive Gateway	O_DECLINED	544	0	100.00%	1	99.82%
	W_Beoordelen fraude	56	1	98.25%	0	100.00%
A_PARTLYSUBMITTED Exclusive Gateway	A_DECLINED	1754	2591	40.37%	1091	61.65%
	A_PREACCEPTED	4557	1091	80.68%	2591	63.75%
A_PREACCEPTED Exclusive Gateway	A_ACCEPTED	3671	36	99.03%	516	87.68%
	A_CANCELLED	36	516	6.52%	28	56.25%
	W_Afhandelen leads	2505	0	100.00%	8	99.68%
O_ACCEPTED Exclusive Gateway	A_ACTIVATED	1210	5	99.59%	677	64.12%
	W_Valideren aanvraag	11	677	1.60%	5	68.75%
START_EVENT Exclusive Gateway	A_PARTLYSUBMITTED	0	3066	0.00%	0	N/A
	A_SUBMITTED	10031	0	100.00%	3066	76.57%

Close

Transition info ✕

A_APPROVED → A_REGISTERED

attr-resource not in ["10629", "11339"]

OR

attr-resource in ["10629", "11339"] AND TRACE:AMOUNT_REQ > 6500.0

Go to gateway

Rules overview

Migrants

Close

Set and monitor KPIs

- Set KPIs based on case lead-time and cost, activity throughput, activity wait-time, resource allocation and cost
- Monitor in process views and dashboards

KPI settings

Project settings

Activity costs

Activity WT

Resource costs

Role costs

End Activities

Simulation

Case duration thresholds:

Between

1

days

and

19

days

Case cost thresholds:

Between

16

\$

and

17

\$

Activity:

Default

Reset all to default

Activity throughput thresholds:

Between

5

hours

and

2

days

Activity wait queue thresholds:

Between

5

hours

and

2

days

Activity duration thresholds:

Between

5

hours

and

2

days

Resource allocation thresholds:

Between

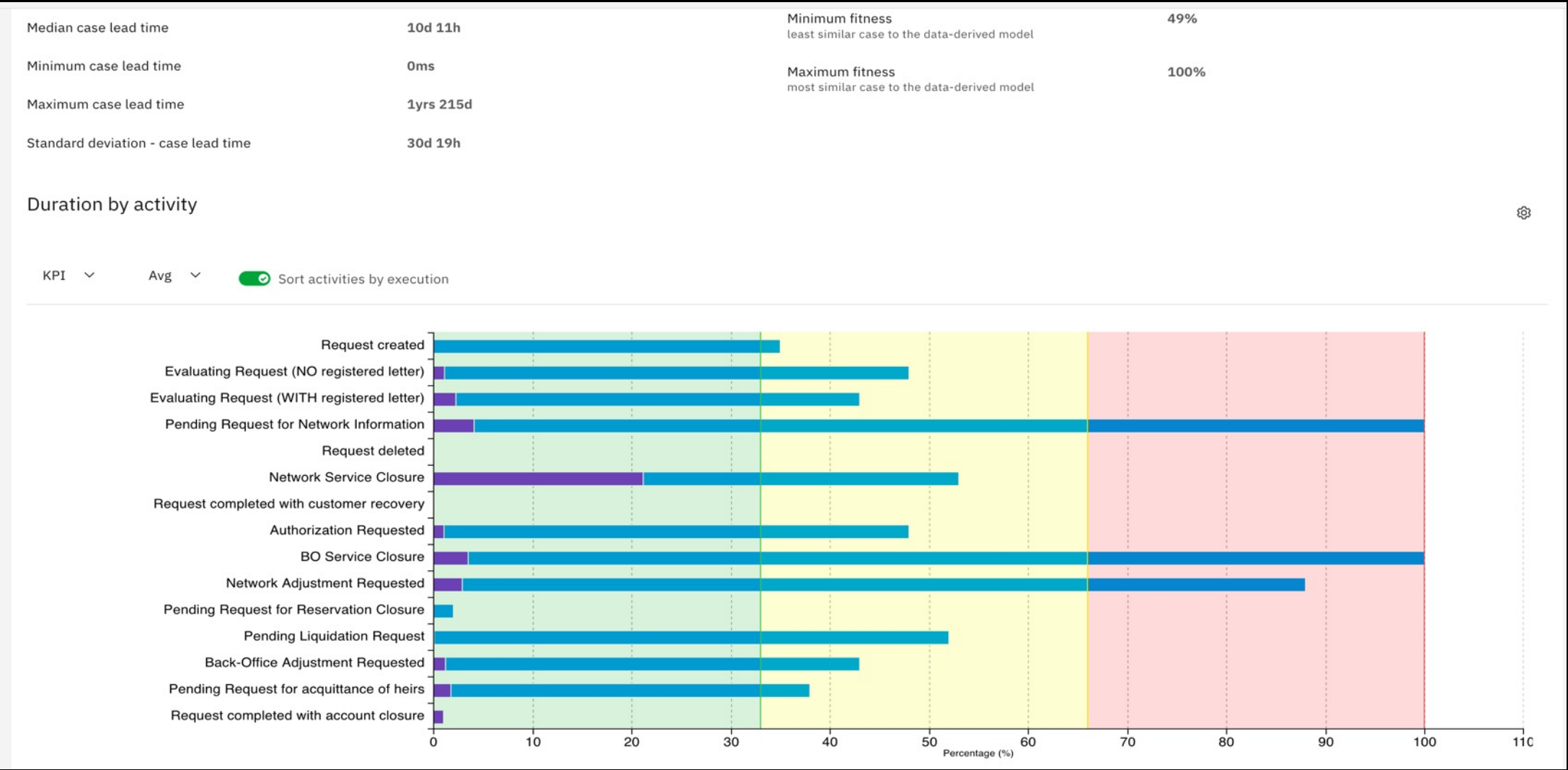
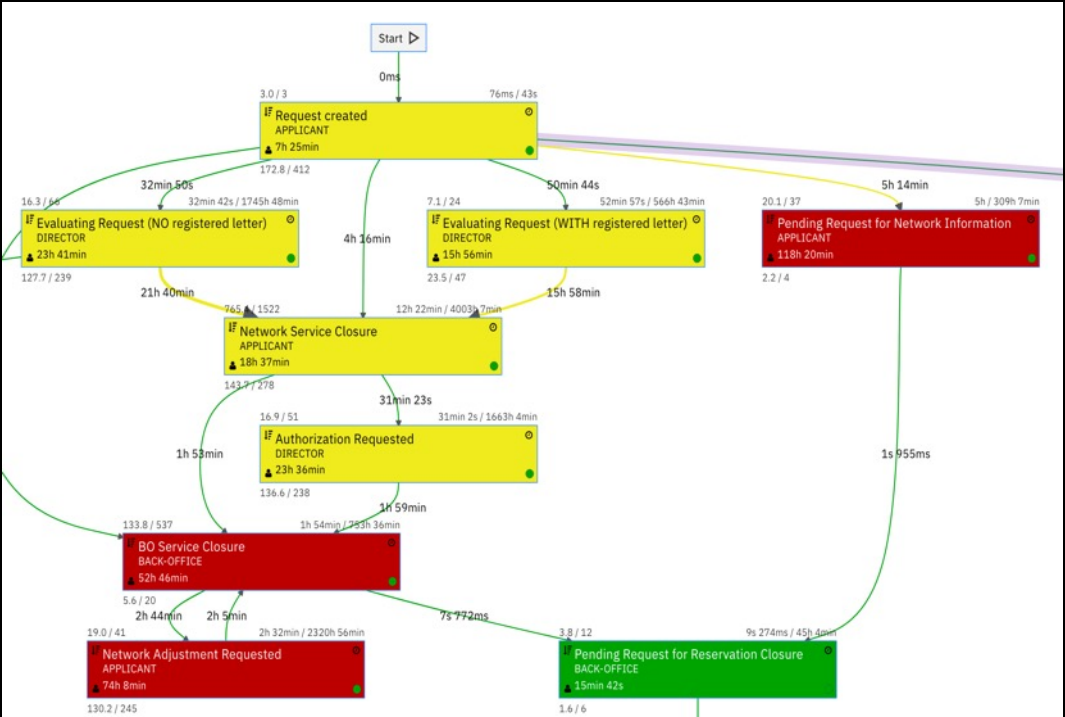
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and

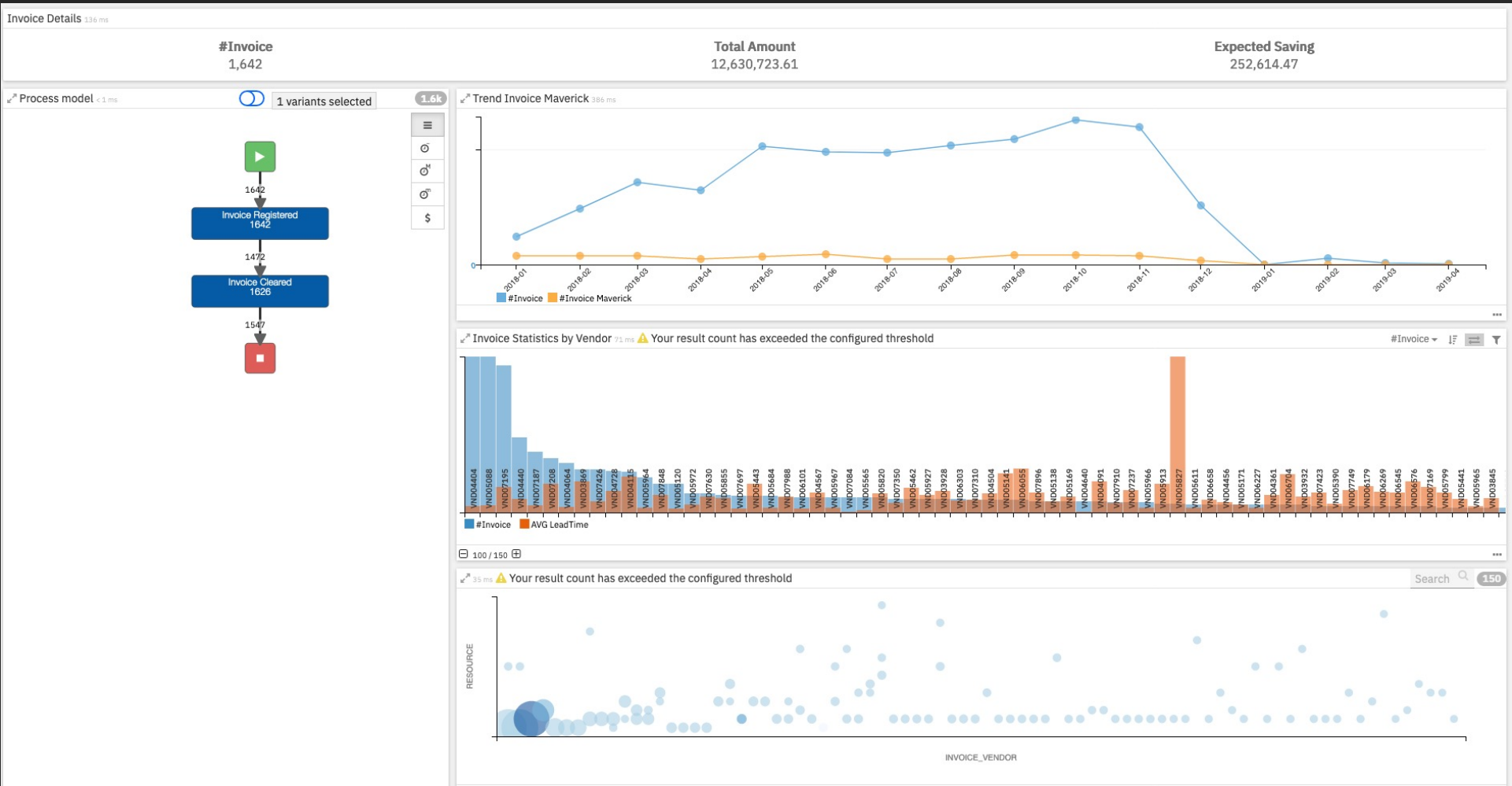
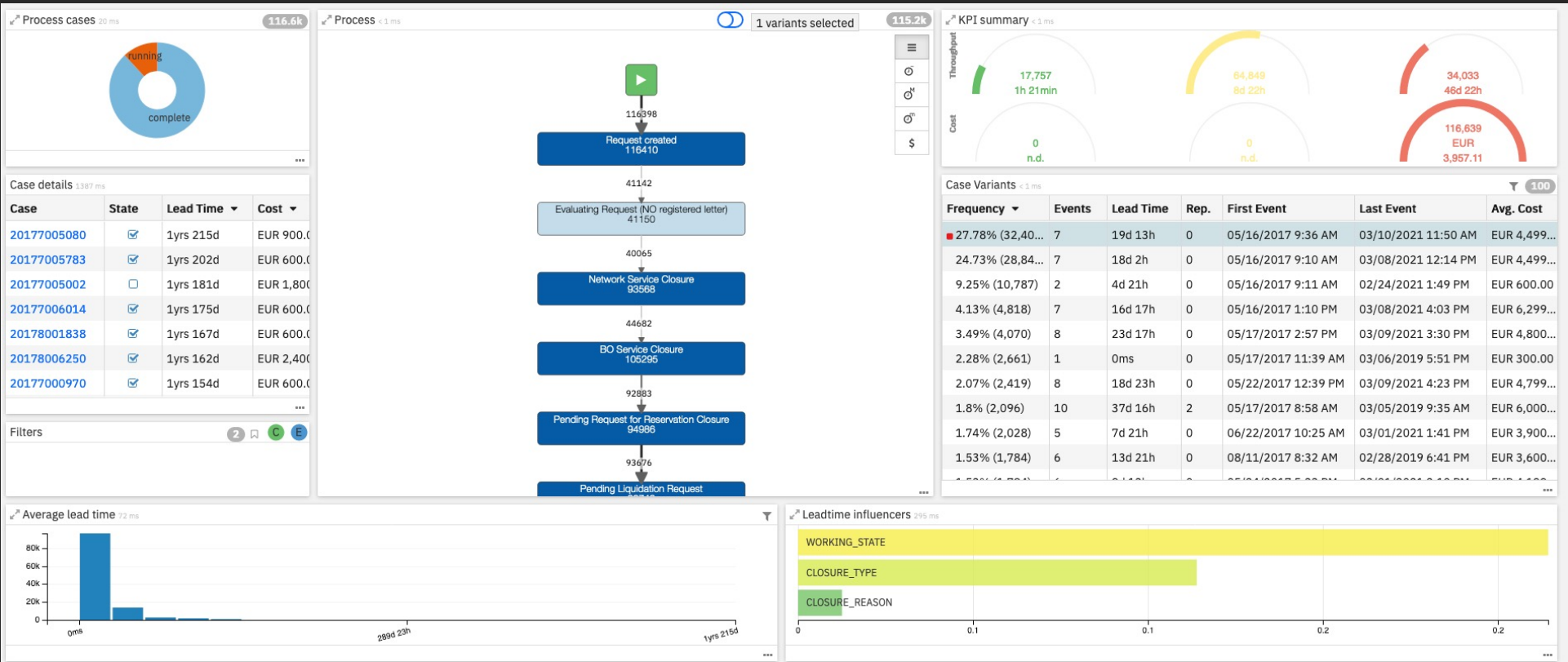
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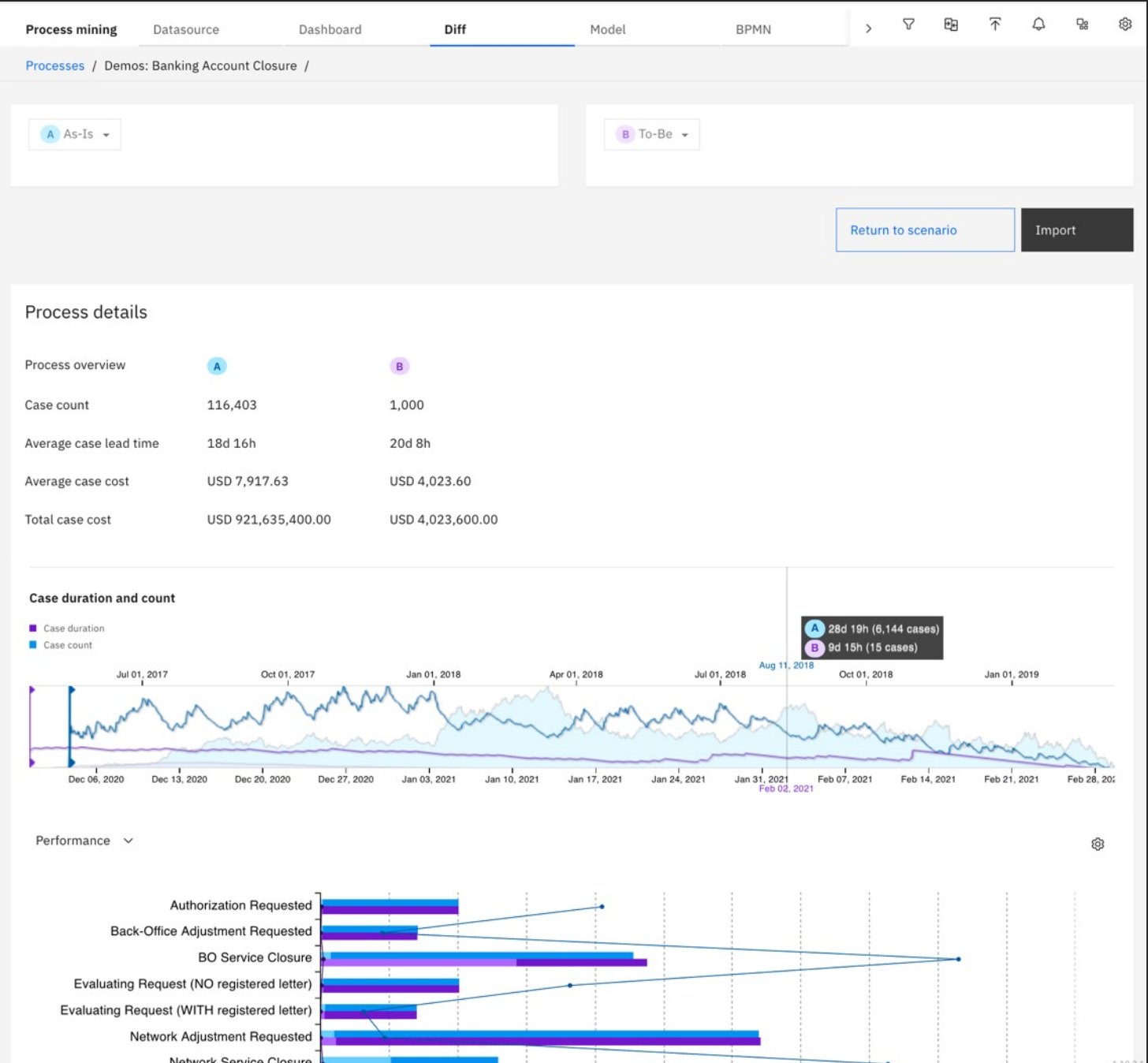
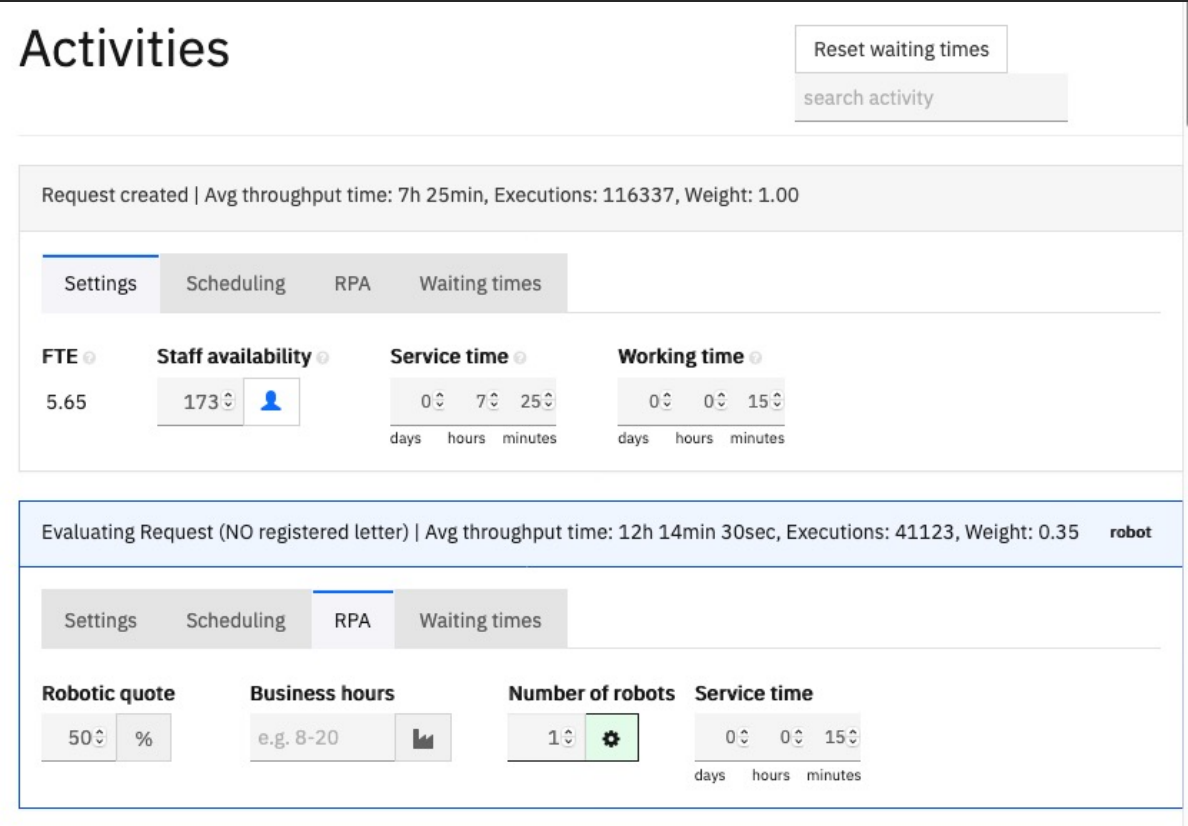
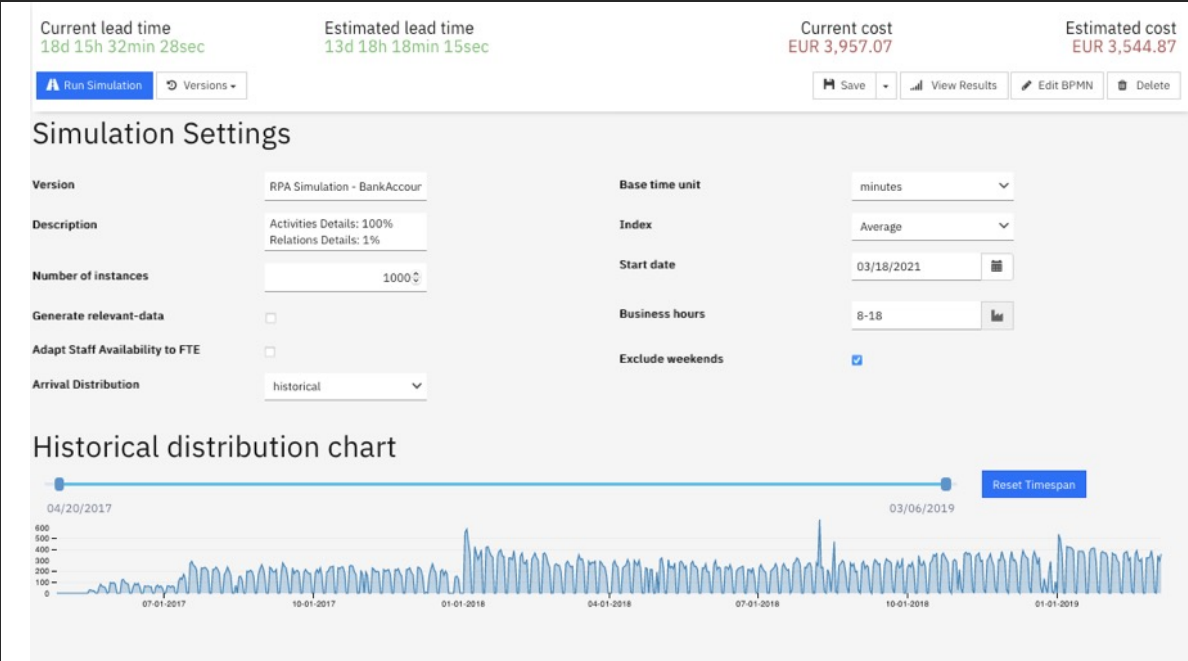
Monitor processes with dashboards

- Generic overview dashboards
- Customizable business dashboards built from widgets with low-code UI
- Out-of-the box Procure to Pay and Order to Cash dashboards such as Maverick purchases



Simulate your business with Digital Twin before engaging development costs

- Create scenarios from as-is process: allocating resources, adding RPA bots, changing processes and rules
- Run simulations and compare as-is and to-be side by side: processes, KPIs, costs
- Load BPMN models from [Blueworks Live](#) or [BAW](#) and run simulations to verify achievement of business goals

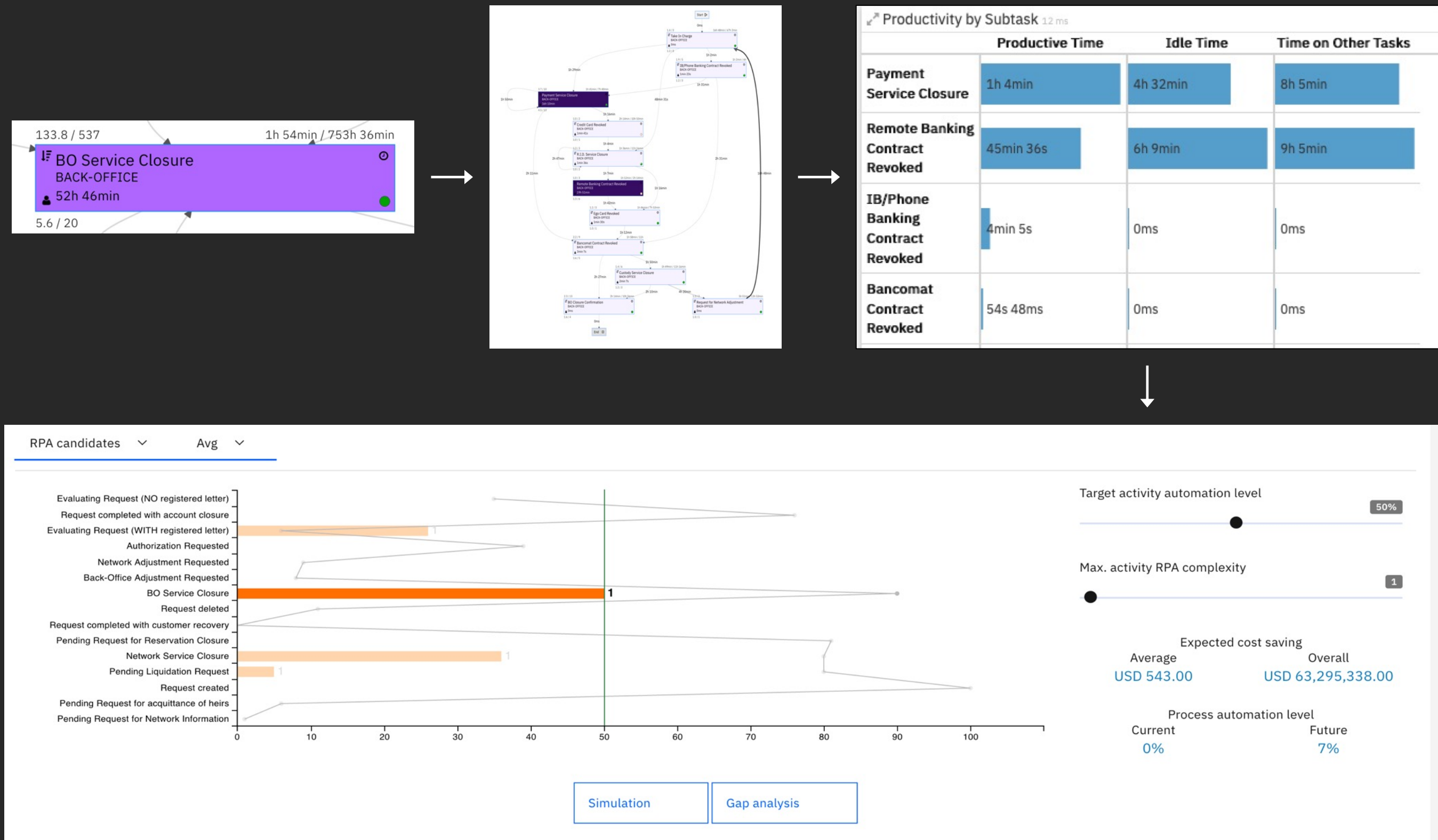


Task Mining

Record user tasks to drill-down into process activities or when application logs not available

Process Mining tells us:
52h42min in BO Service Closure activity

- Record actual user tasks that pertain to this activity (only)
- Mine the recorded task as sub-processes
- Identify reworks, and dominant variants
- Determine productive time, idle time, and time spent elsewhere
- Get recommendations on **RPA candidates** based on RPA complexity and automation level goals?



The Process Mining personas



1

Process setup

Business Analyst
Business Owner
Data Specialist

2

Process Mining

Business Analyst

3

Task Mining

Automation Developer
(scope recording)

Business User
(record desktop actions)

4

Compliance

Business Analyst

5

Automation analysis

Business Analyst

6

KPI and performance

Business Analyst
Business Owners

7

Simulation

Business Analyst

8

Real-time and predictive analytics

Business Owner
Business Analyst

9

Automation plan

Business Analyst
Business Owner
Automation Developer

Procure to Pay (P2P)

Accounts payable process:

1. Purchase request
2. Purchase order
3. Receive goods
4. Receive invoice
5. Match invoice against received goods
6. Match invoice against PO
7. Generate payment

Where does data come from?

- ERP (SAP, Oracle)
- AP System
- Desktop (invoice matching)
- Ad hoc systems

What improvements?

- Specific systems/applications to update
- Automated ticket classification
- Automated skill identification
- Automated steps that make a difference

What are we looking for? What KPI's?

- Time to resolution
- Non-compliance: novel tickets/causes, tickets reopened
- Error rates: Incorrect transcription of data from tickets, incorrect system configurations, invalid tickets
- Bottlenecks: manual system updates, escalations

Incident resolution

IT process:

1. Incident report
2. Trouble ticket opened
3. Investigation started
4. Skills identified to resolve
5. Interactions with impacted systems
6. Interactions with ticket opener
7. Resolution identified, executed
8. Ticket closed

Where does data come from?

- Ticketing systems
- Impacted IT systems
- Desktops
- Ad hoc systems

What improvements?

- Specific systems/applications to update
- Automated ticket classification
- Automated skill identification
- Automated steps that make a difference

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Thank You