



PegaWorld*iN*spire

# Pega Process Mining 101: Transforming and Evolving Your Processes for Continuous Optimization

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VP Process Mining, Pega



# Agenda

What you'll learn during this breakout

**Who**

**Introduction:** Who am I?

**Why**

**Motivation:** Why do you need process mining?

**What**

**Definition:** What is process mining? Some history...

**How**

**Technical Talk:** How does process mining work?

**When**

**Use cases and user stories:** When should we use it?  
Business value? Autonomous enterprise?

**Where**

**References:** Where should you go next?



# Who Am I? Hello, I Am Kleber Stroeh!

VP, Process Mining at Pega

- Previously:
  - Co-founder and CEO of EverFlow
  - Co-founder of Icaro Tech and IVP

MSc in Computer Science

- Applied Machine Learning

25+ years of experience in software industry

Researcher and author of papers on Process Mining

Proud father of two beautiful girls, devoted husband

Guitar player and vocalist in training







# Why Do You Need Process Mining?





# Your Mission:

"Go free us from all inefficiencies and automate everything that matters!"



# ...“Yes, Boss!”

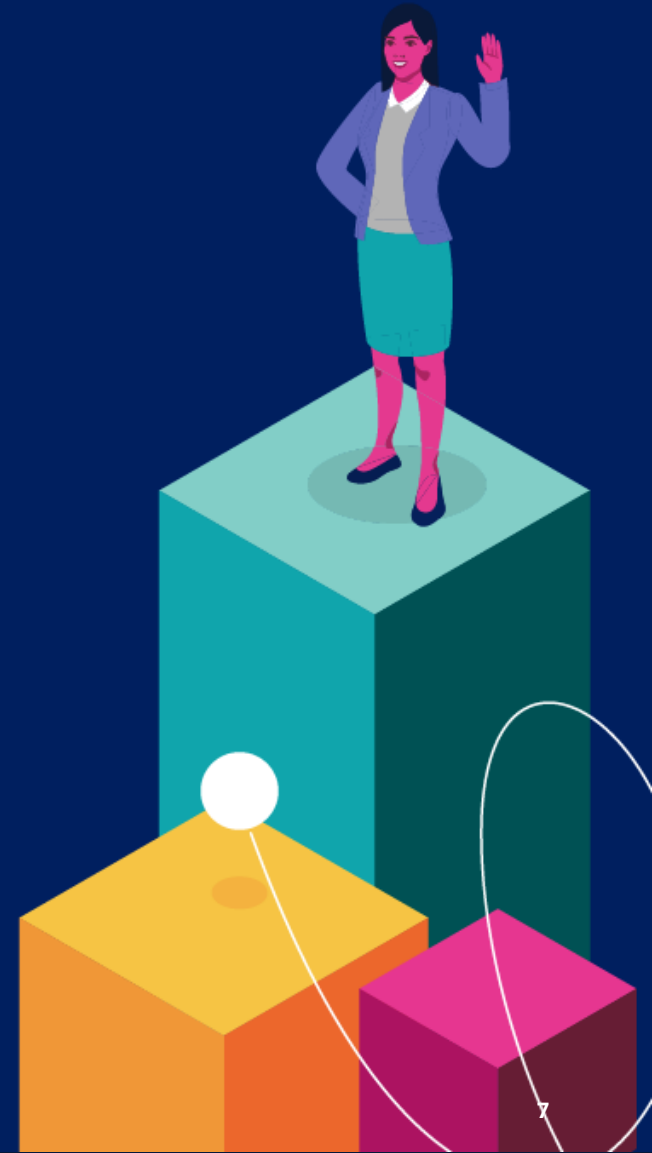
But no visibility makes that mission impossible



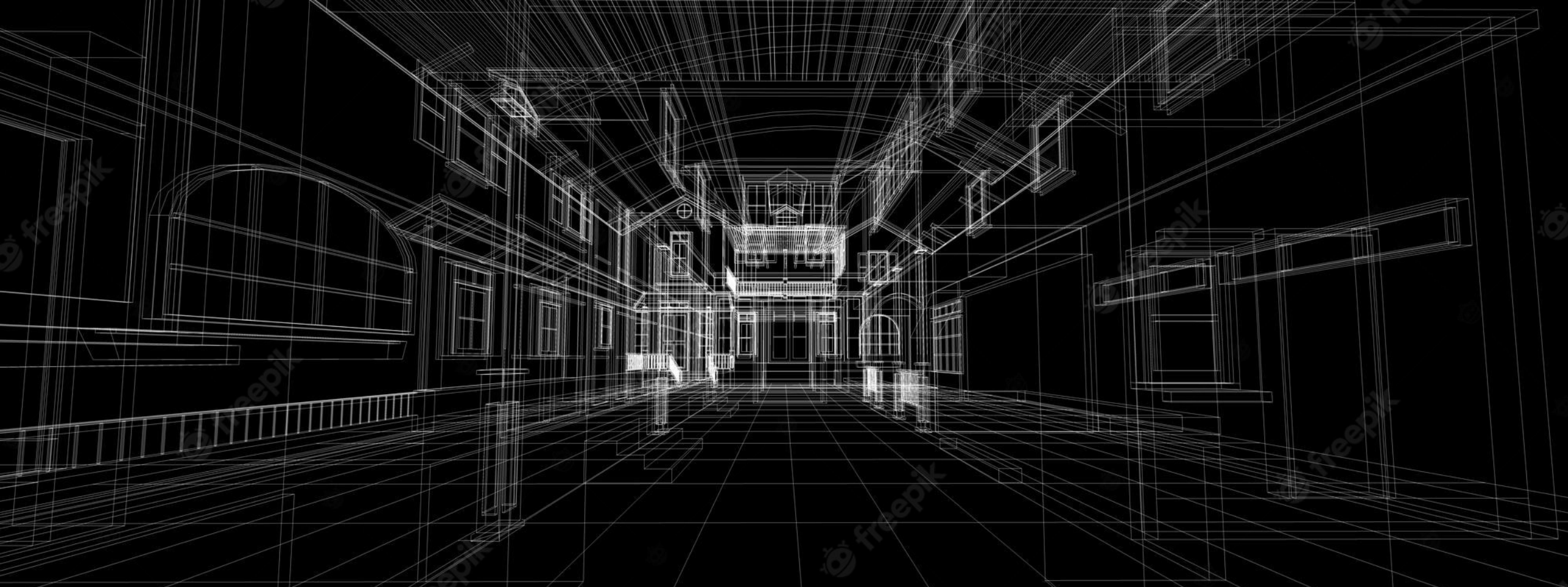
# Process Mining Adoption is Accelerating Quickly

Enterprise companies are adopting process mining for cost reduction and automation

**“By 2025, 80% of organizations driven by the expectations of cost reduction and automation-derived enhanced process efficiency will embed process mining capabilities in at least 10% of their business operations.”**







# What is Process Mining?





**Process  
Management**

**Process Mining**

**Data  
Mining**



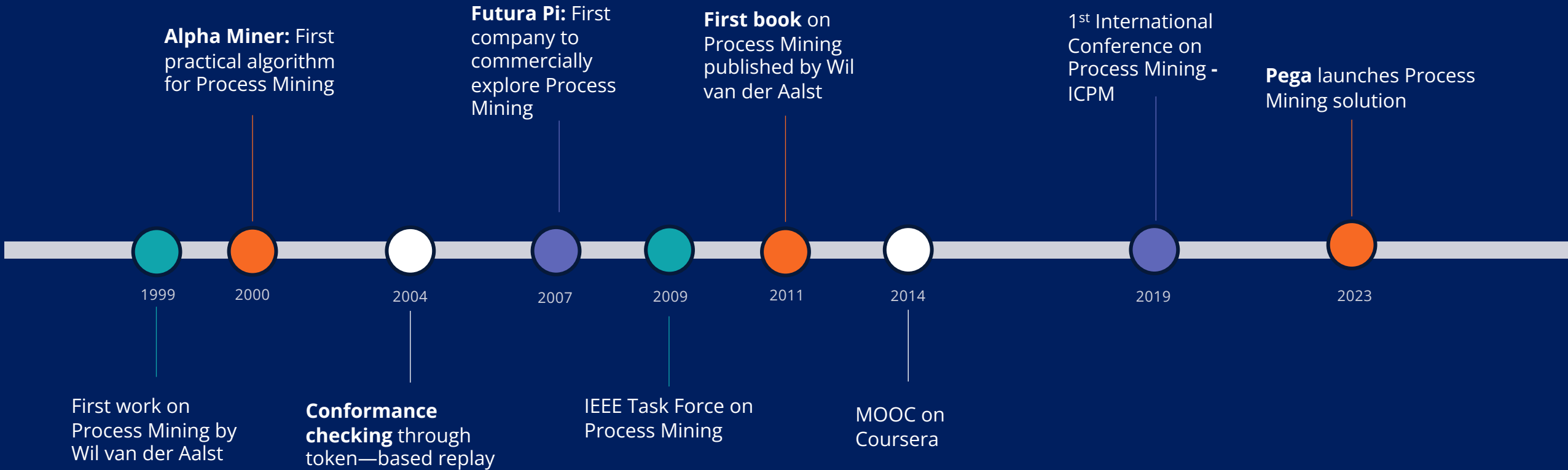
**Expectation  
vs.  
Reality**





# Process Mining History

A brief take on its history...



# Process Mining + Task Mining

Analysis of full process across systems



End-to-end process optimization

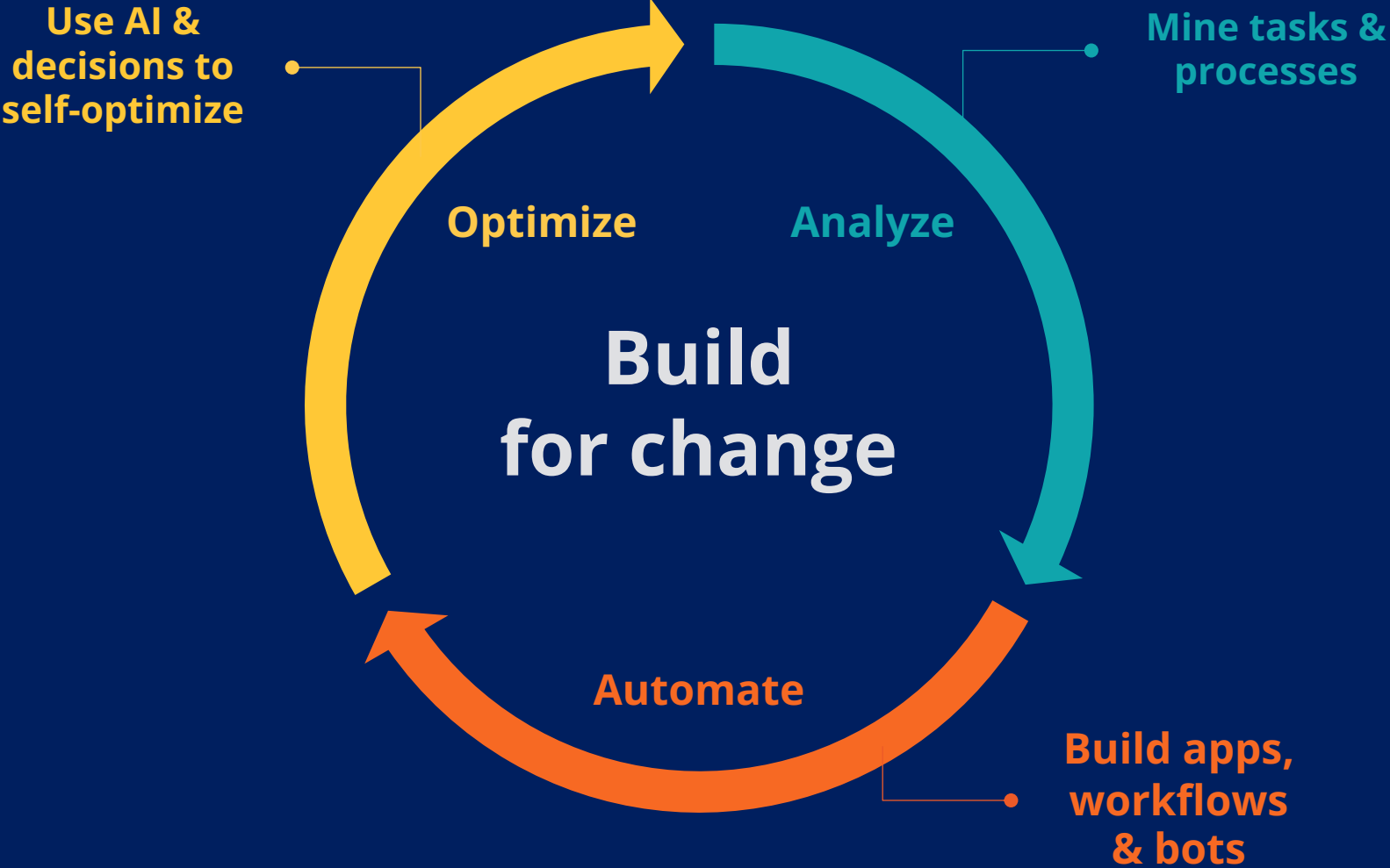
Automate individual work tasks



Desktop activity analysis

# Process Mining and Continuous Optimization

Where does Process Mining fit into the autonomous enterprise?







# How Does Process Mining Work?



# Digital Footprints in the Sand

## Data sources for Process Mining

- System logs (files, databases)
  - ERP
  - CRM
  - RPA
  - IT service management
  - Workforce management
  - IVR
  - Web servers
  - Apps
  - Legacy systems

# Mapping Events Into Processes

Three fields:



Work_Order_Id	Start_Timestamp	Status	Type	Assignee	Event_Cost_USD	
1	2018-04-04 21:34:35	Assigned	PC	Zachary Shepherd	112.85	
1	2018-04-05 03:13:08	Dispatched	PC	Zachary Shepherd	60.06	
1	2018-04-05 06:13:19	Received	PC	Zachary Shepherd	1.94	
1	2018-04-05 06:19:08	Accepted	PC	Zachary Shepherd	191.66	
1	2018-04-05 15:54:06	On the Way	PC	Zachary Shepherd	14.05	

**That's all you need!**



# Mapping Events into Processes

Three fields:

A Case ID	Timestamp	A Activity	Type	Assignee	Event_Cost_USD	
	2016-04-35		PC	Zachary Shepherd	112.85	
			PC	Zachary Shepherd	60.06	
			PC	Zachary Shepherd	1.94	
			PC	Zachary Shepherd	191.66	
			PC	Zachary Shepherd	14.05	

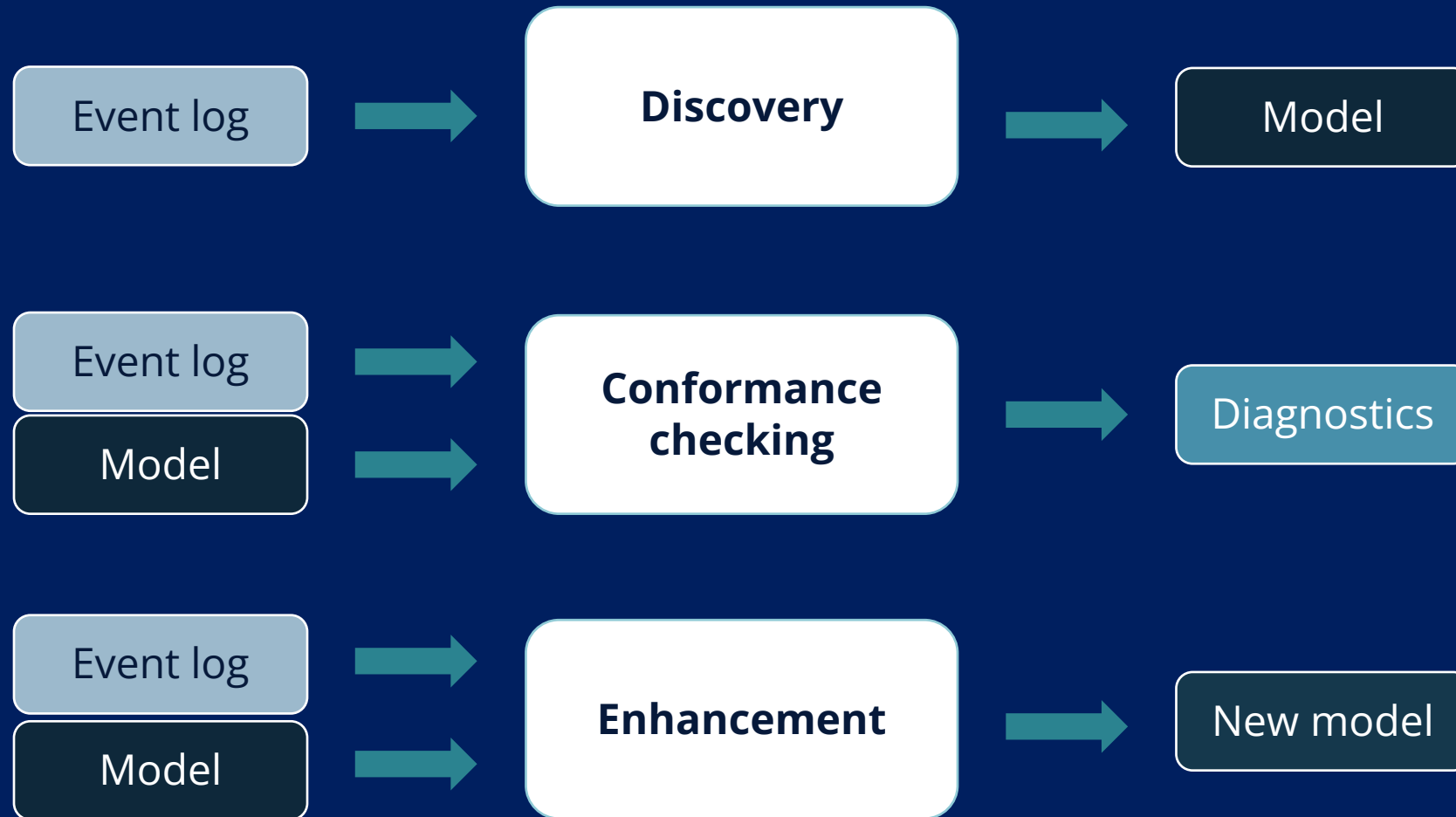
**Identification of process instance**  
(i.e., ticket ID, purchase order number, customer ID)

**Point in time when something happened**

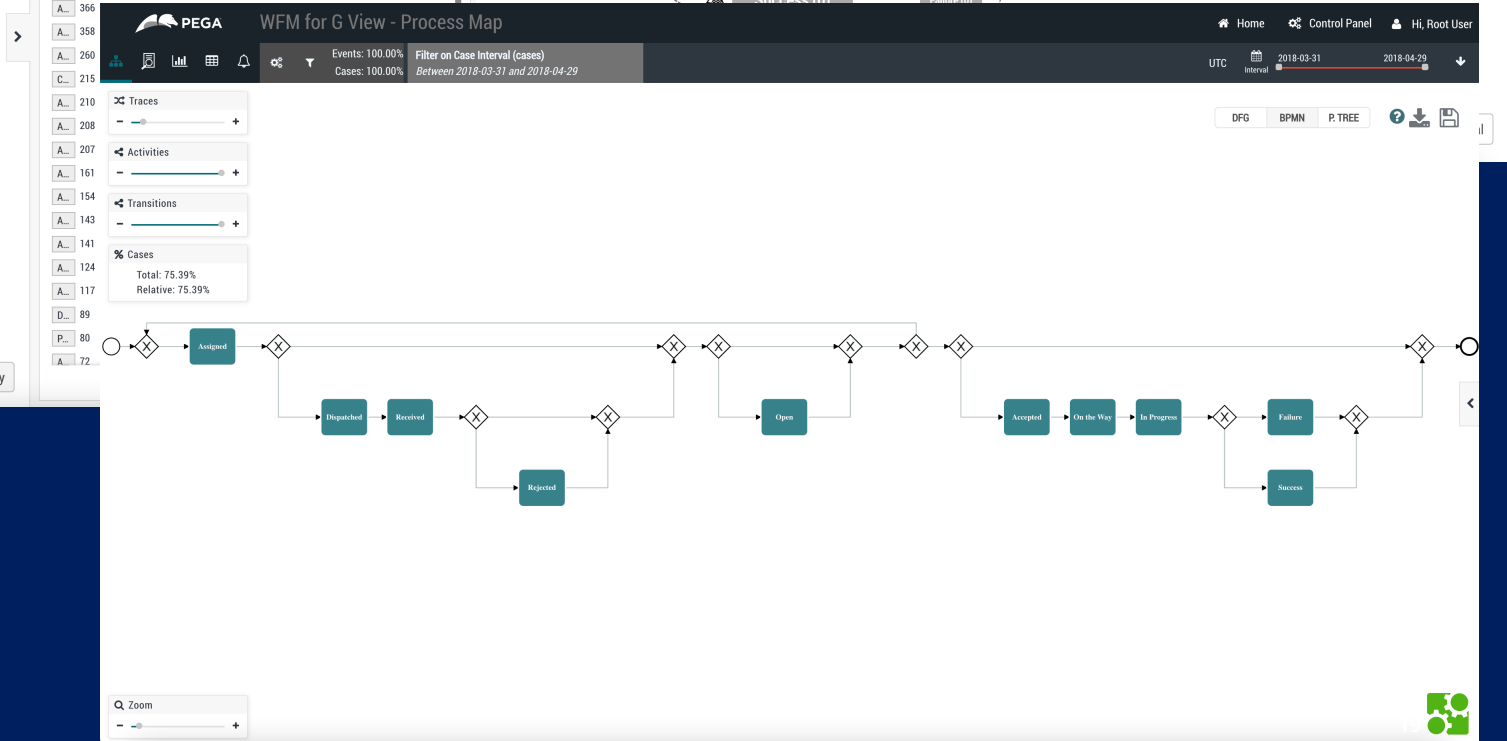
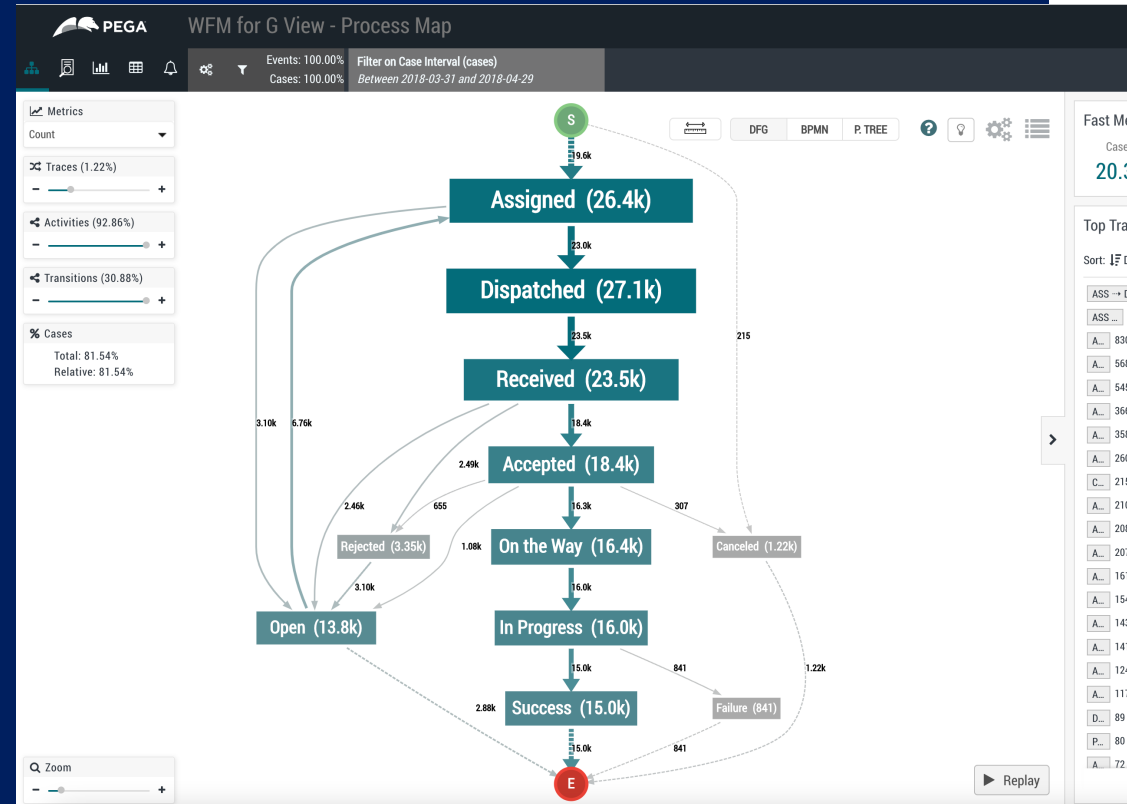
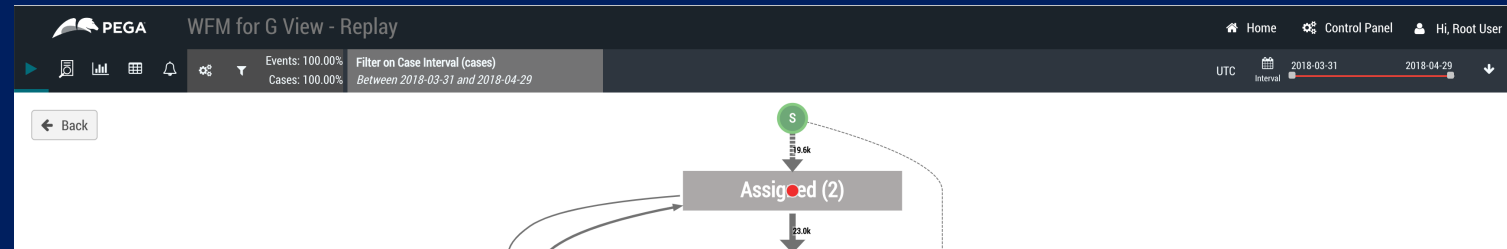
**What happened**  
(i.e., stage, step, action)

That's all you need

# Types of Process Mining



# Discovery



# Conformance Checking

PEGA WFM for G View - Analyses

Events: 100.00% Filter on Case Interval (cases)  
Cases: 100.00% Between 2018-03-31 and 2018-04-29

Home Control Panel Hi, Root User UTC Interval 2018-03-31 2018-04-29

## Undesired Activities

Activities

Type anything to search

Select: All / None

Activities	Undesired
Accepted	<span style="color: red;">✘</span>
Assigned	<span style="color: red;">✘</span>
Canceled	<span style="color: red;">✘</span>
Dispatched	<span style="color: red;">✘</span>

Undesired activity **Canceled** impacted 1220 cases, 6.00% of total

Undesired activity **Failure** impacted 841 cases, 4.14% of total

### Affected Cases

### Average Case Duration

### Average Case Cost

Show in graph Show cases Look for probable causes Dismiss

PEGA WFM for G View - Analyses - Model: Ref Model

Events: 100.00% Filter on Case Interval (cases)  
Cases: 100.00% Between 2018-03-31 and 2018-04-29

Home Control Panel Hi, Root User UTC Interval 2018-03-31 2018-04-29

## Model Violations

The following trace is **not compliant** with the model and affected 545 cases, 2.68% of total

Assigned → Dispatched → Received → Open

### Affected Cases

3%  
545 / 20.3k

2.68% of total cases

### Average Case Duration

Avg. duration: affected cases vs. non-affected cases

### Average Case Cost

Avg. cost: affected cases vs. non-affected cases

Show in graph Show cases Look for probable causes Dismiss

### Model Deviation

Assigned → Dispatched → Received → Accepted → On the Way → In Progress → Success → Open

The following trace is **not compliant** with the model and affected 366 cases, 1.80% of total

Assigned → Open → Assigned → Dispatched → Received → Accepted → On the Way → In Progress → Success



# Enhancement

PEGA WFM for G View - Analyses - Model: Ref Model

PERFORMANCE

- Slow Transitions
- Reworks
- Bottlenecks
- Summary

CONFORMANCE

- Model Violations
- Undesired Activities
- Summary

SIMULATION

- What-if

BENCHMARKING

- Side-by-side Comparison

SOCIAL

- Activities
- Resources

PREDICTIVE

- Case Duration

ADVANCED

- Root Cause
- Traces

## Reworks

Reexecution of activities within the trace **Assigned** → **Dispatched** → **Received** → **Rejected** → **Open** → **Assigned** → **Dispatched** → **Received** → **Accepted** → affects 830 cases, 4.08% of total, which add to 1y77d

On the Way → In Progress → Success affects 358 cases, 1.76% of total, which add to 218d17hs

### Affected Cases

4%  
830 / 20.3k  
4.08% of total cases

### Average Case Duration

Category	Avg. Duration
Affected	12hs46m
Non-affected	10hs27m

Avg. duration: affected cases vs. non-affected cases

PEGA WFM for G View - Analyses - Model: Ref Model

PERFORMANCE

- Slow Transitions
- Reworks
- Bottlenecks

## Bottlenecks

Bottleneck at **Accepted** occurred at approximately 2018-04-17 07:19:12, involving 279 events

### Activity Distribution

Date: 2018/04/17  
Maximum value: 279

Activity concentration over time

Show in graph  
Show cases  
Look for probable causes

PEGA WFM for G View - Dashboards - Model: Ref Model

DASHBOARDS

- Process Mining Dashboard
- new dashboard

INSIGHTS

CONTROLS

METRICS

- Case Duration
- Case End Timestamp
- Case Event Count
- Case Start Timestamp

MAIN COLUMNS

OTHER COLUMNS

## Dashboard - New Dashboard

### Process Overview

```

    graph TD
      S((S)) -- 26.4k --> A[Assigned (26.4k)]
      A -- 27.1k --> D[Dispatched (27.1k)]
      D -- 23.5k --> R[Received (23.5k)]
      R -- 18.4k --> AC[Accepted (18.4k)]
      R -- 3.35k --> RE[Rejected (3.35k)]
      AC -- 16.4k --> OW[On the Way (16.4k)]
      AC -- 2.4k --> O[Open (13.8k)]
      OW -- 16.0k --> IP[In Progress (16.0k)]
      IP -- 15.0k --> SUC[Success (15.0k)]
      IP -- 0.41 --> F[Failure (0.41)]
      SUC -- 15.0k --> E((E))
      O -- 3.1k --> A
      RE -- 2.4k --> A
      F -- 2.8k --> O
      
```

### Response Time

Avg.: 10hs50m

Response Time	Count
320ms	10.3k
5hs14m	486
10hs20m	853
15hs43m	1.29k
20hs57m	1.34k
1d02hs	351
1d12hs	77
1d17hs	166
1d23hs	301
1d23hs	168
2d4ms+	548

### City

City	Count
New York City	~5.5k
Chicago	~3.5k
Los Angeles	~2.5k
Houston	~2.0k
Philadelphia	~1.5k
Dallas	~1.0k
San Diego	~0.8k
Austin	~0.5k
San Francisco	~0.4k
Jacksonville	~0.3k

### Execution Time

Avg.: 1hs16m

Execution Time	Count
40ms	5.39k
40ms2s	5.11k
1hs20m	2.45k
2hs1m	983
2hs41m	443
3hs21m	216
4hs1m	128
4hs42m	79
5hs22m	37
6hs2m	34
5hs43ms+	133

### Type

Type	Count
Roadside Assi...	~4.5k
PC	~3.5k
Plumbing	~2.5k
Maintenance	~2.0k
Electrical	~1.5k
Tech Services...	~1.0k
Washing Machi...	~0.8k
Taxi	~0.5k
Locksmith	~0.4k
Refrigerator	~0.3k

### Case Start Timestamp

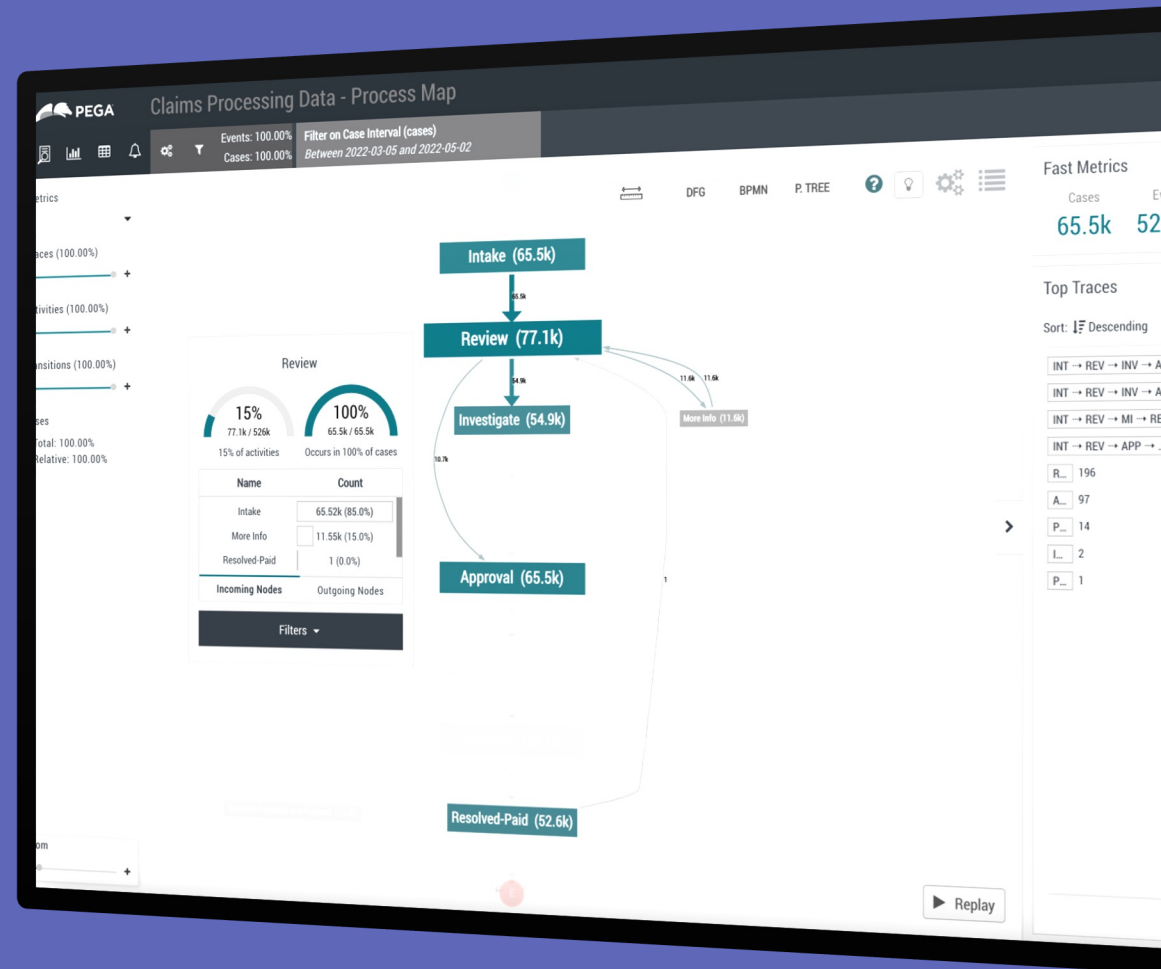
### Top Traces

Sort: Descending

Trace	Count
ASSIGNED → DISPATCHED → RECEIVED → ACCEPTED → ON THE WAY → IN PROGRE...	11.2k
ASSI...	1.87k
A...	830
A...	568

Selected 0 traces of 903

# Demo



Events: 99.41%  
Cases: 99.53%

Filter on Case Interval (cases)  
Between 2022-03-05 and 2022-05-02

Filter on Traces (cases)  
Intake -> Review -> Investigate -> Adjustm...

EDT Interval 2022-03-05 2022-05-02

Metrics

Count

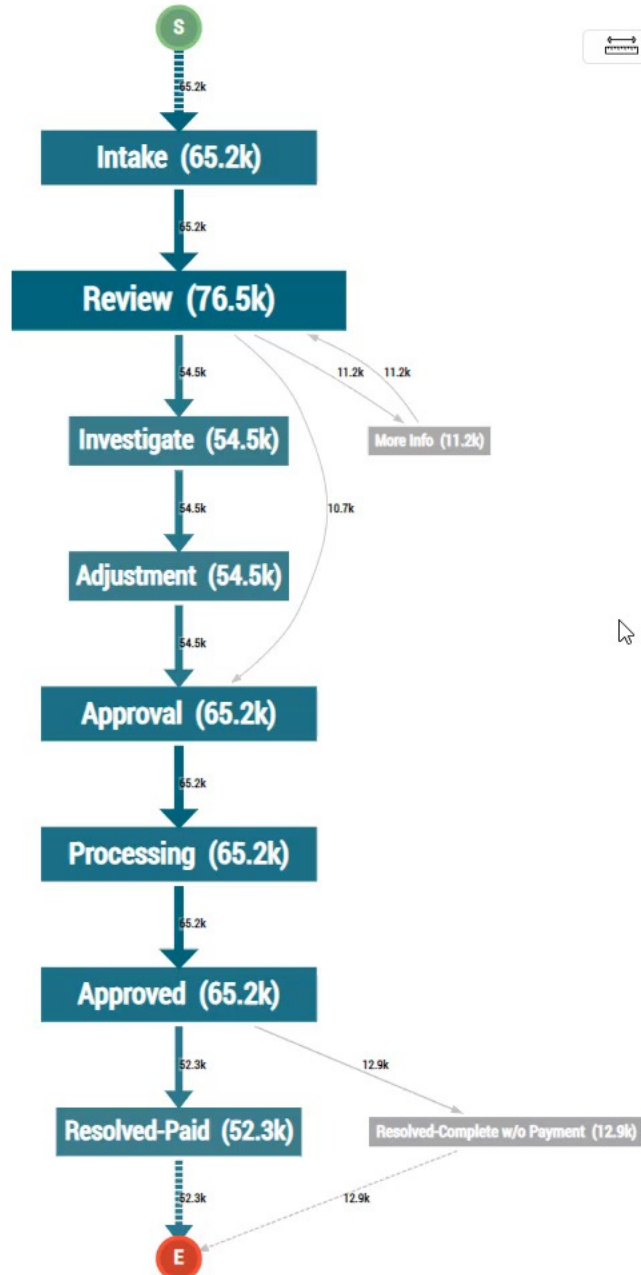
Traces (100.00%)

Activities (100.00%)

Transitions (100.00%)

Cases

Total: 99.53%  
Relative: 100.00%



DFG BPMN P. TREE

Fast Metrics

Cases	Events	Avg. Duration	Total Duration
65.2k	522.9k	15d14hs	2787y201d

Top Traces

Sort: Descending

INT -> REV -> INV -> ADJ -> APP -> PRO -> APP -> RES	30.4k
INT -> REV -> INV -> ADJ -> APP ...	12.9k
INT -> REV -> MI -> REV -> I...	11.2k
INT -> REV -> APP -> PRO ...	10.7k

Replay

Selected 0 traces of 4



## Use Cases and Business Value





# Applications & Business Value



Process optimization  
and automation



Operations  
management



Customer journey  
and experience



Process compliance,  
auditing, monitoring

**Reduce costs** by identifying **bottlenecks**, **reworks** and **faulty processes**

**Improve** customer and employee journeys and satisfaction

**Increase revenue** by pinpointing **upselling** and **cross-selling** opportunities

**Mitigate/reduce** regulatory or SLA penalties

# What Clients Say...

3 companies, 3 different use cases

## Financial institution in NA

- Goal: process improvement and automation
- Context: data-driven org focusing on decentralized process improvement teams

**"The goal for us is to stay #1 in client service. Task Mining got us to a certain point, and Process Mining is going to take us to the next level"**

## Manufacturer in EMEA

- Goal: reduce lead time and increase digitalization
- Context: shared services center leveraging Pega COE

**"We have a goal to reduce costs by 7% every year"**

## Large bank in LATAM

- Goal: reduce friction and increase customer loyalty
- Context: fast-paced digital transformation journey

**"We suspect some things in the process, but without data we cannot prove that in the organization"**

# What's Great about Pega Process Mining

Power in the hands of the citizen process miner = shorter time-to-value

## Easy to use

A simple user experience allows business users to mine processes without the need for deep technical skills

## Powerful insights

Deep capability in AI, analysis, and visualization – combined with the power of the Pega Platform – maximizes the impact of your results and reduces time-to-value

## Effortlessly scalable

Full support for a wide range of big data scenarios; designed for the enterprise



**Where Should I Go to Learn More?**





# Ready To **Transform Your Processes** With Pega Process Mining?

Request a demo today, or...

- Join our Process Mining meetup at lunchtime on Tuesday in the Grand Ballroom
- Visit our three booths in the Innovation Hub!



**PEGA<sup>®</sup>**

Build for Change<sup>®</sup>