Process mining

Added value of data driven technology

July 4th, 2024

Joanknecht.com

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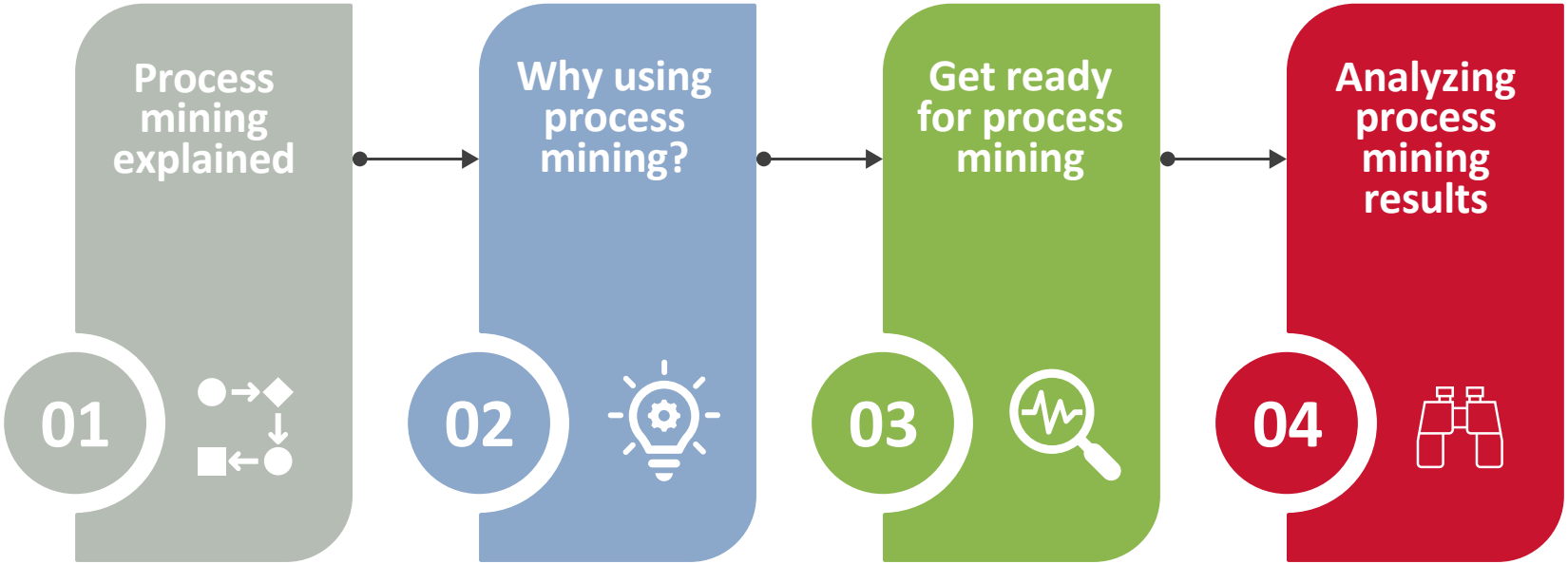
Process mining: Added value of data driven technology



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About Joanknecht

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About Joanknecht

Joanknecht is a boutique audit and consulting firm. With our roots in Brainport Eindhoven, IT is an important starting point in all our activities.

IT Assurance

Our IT auditors are experts in the field of IT audit & assurance, IT security & privacy, governance risk & control, business intelligence and process mining.

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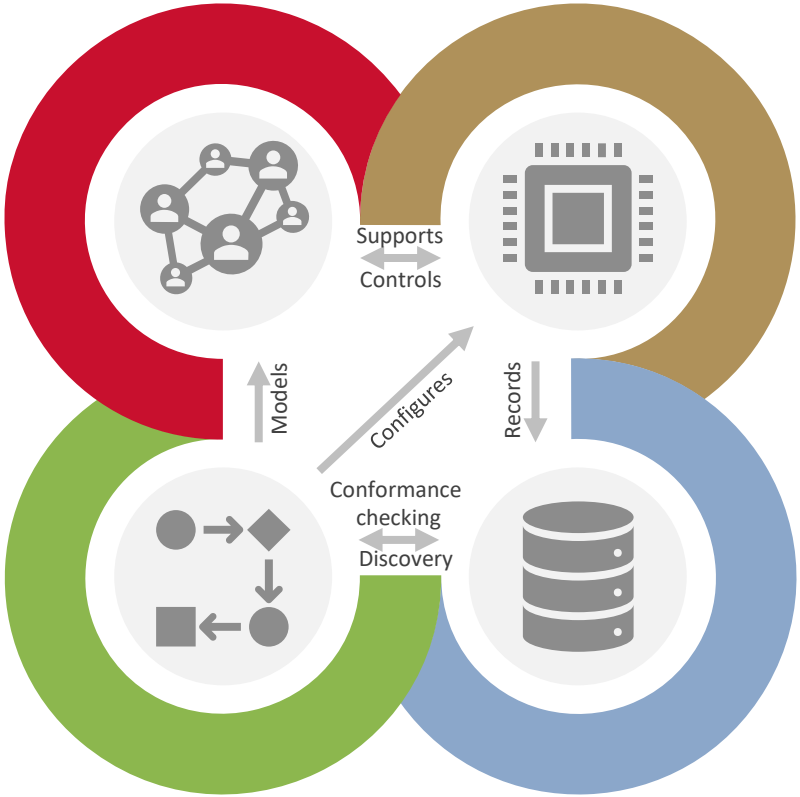
What is the concept of process mining?

2. Operational process

The actual processes in the organization

3. Information systems

The supporting information systems for the Operational Processes. Responsible for recording relevant activities in the processes.



1. Process model

The process as designed by the business process modeler/Enterprise Architecture

4. Event logs

Based on all changes in activities stored in the information systems, specific event logs are generated. These logs will provide the data for the Process Mining analysis

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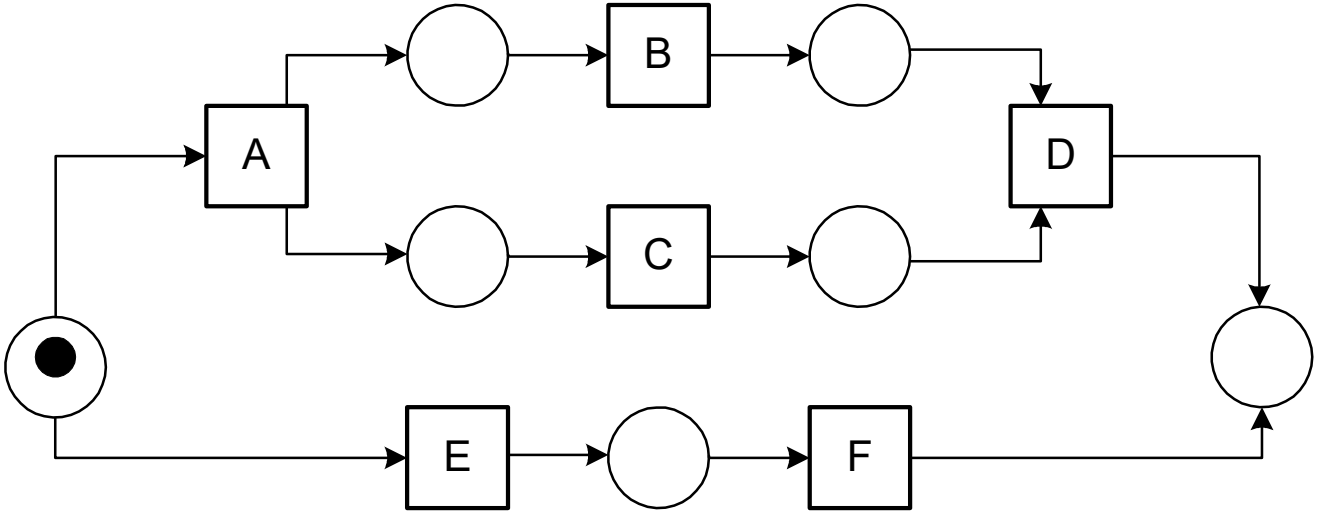
Process model



case 1 : Activity A
case 2 : Activity A
case 3 : Activity A
case 3 : Activity B
case 1 : Activity B
case 1 : Activity C
case 2 : Activity C
case 4 : Activity A
case 2 : Activity B
case 2 : Activity D
case 5 : Activity E
case 4 : Activity C
case 1 : Activity D
case 3 : Activity C
case 3 : Activity D
case 4 : Activity B
case 5 : Activity F
case 4 : Activity D

Goal

1. What do you want to achieve?

Like every data analysis project, process mining should always start with a specific research question!

2. How can this research question be answered?

Is process mining the way to go? Or is a more static data mining approach more appropriate?

3. When applying process mining, which aspects are required?

- **Case**: what identifies the unique key in this process (e.g. a ticket id)?
- **Activities**: which activities in the lifetime of the case can be distinguished (e.g. opening ticket, impact analysis, closing, etc.)?
- **Timestamp**: When did these activities occur?
- **Other attributes** relevant for answering the research question (e.g. who performed the activity, are other departments involved, etc.)

Multiple use cases

1. Process improvement

Process mining gives excellent opportunities to get a better view on how processes are actually performing in real life, because it is a fact-based visualization of the processes.

- Better understanding of the actual process
- Review actual processes compared to the desired paths
- Which activity can be classified as the main bottleneck, and who or what is responsible?
- Minimize the number of variancies in possible paths.
- How many exceptions exist compared to the main process (the ‘happy path’), and what are the related costs of those deviations?
- Which ‘elephant paths’ exist, and is this always wrong or what can be learnt?

Multiple use cases

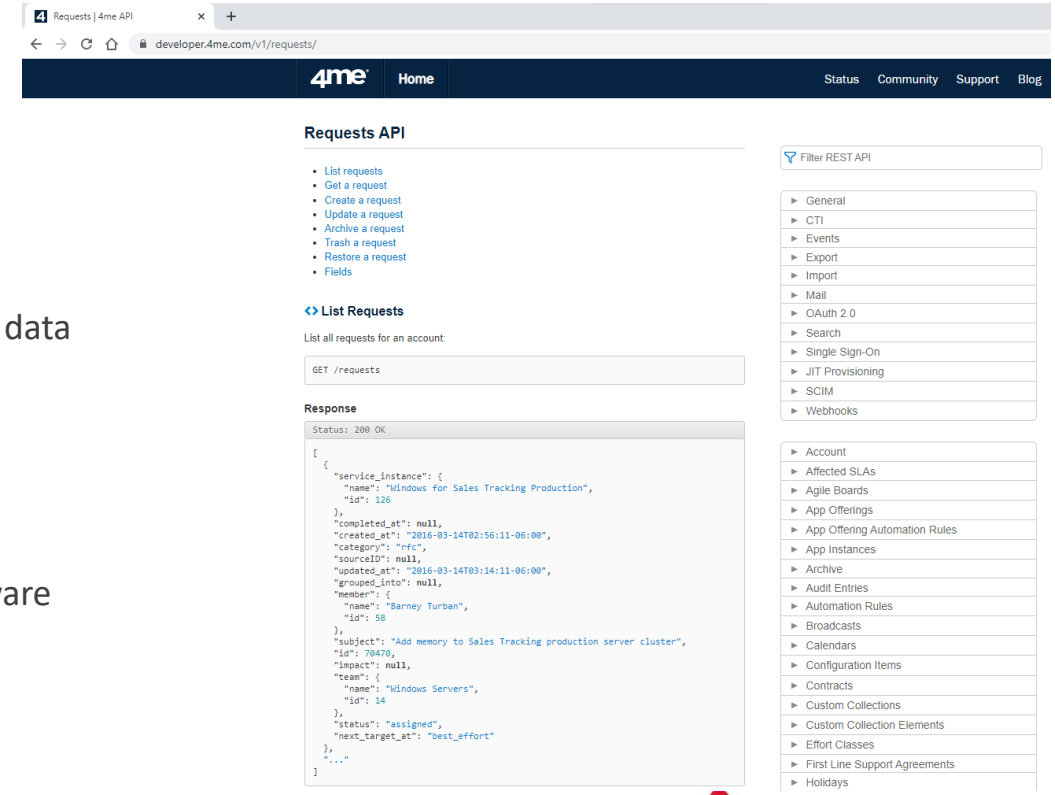
2. (internal) Audit and Compliance support

Process mining also gives excellent opportunities to support (internal) audit, compliance and IT security departments.

- Have activities been performed in the wrong (mandatory) order?
- Have transactions been changed after approval by authorized employees?
- Is the required Segregation of Duties always followed?
- Focus on outliers!

The ETL proces

1. Extract data from IT systems
   - Finding/creating data
   - Extracting data
2. Transform data to “process mining proof” data
   - Transforming to usability
   - Different formats
   - More or less data
3. Load and analyze
   - Loading into the process mining software
   - Applying filters
   - Analyzing results



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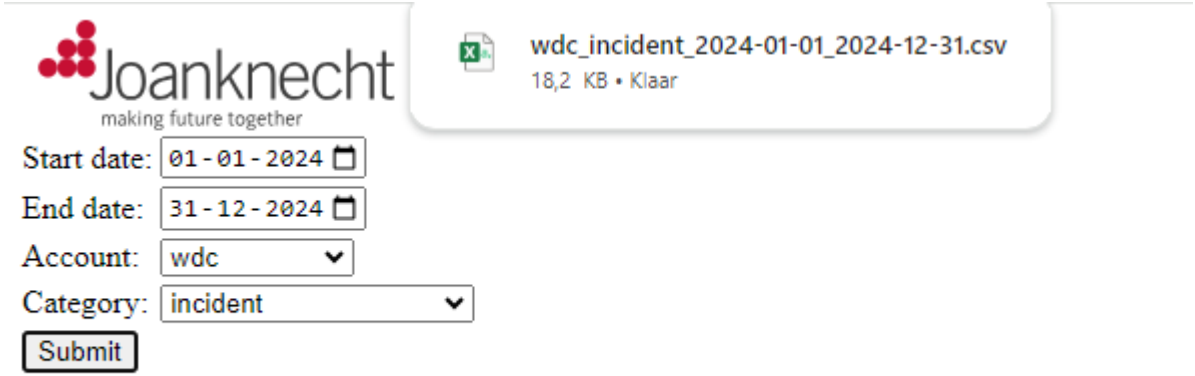
ETL: Automatic Process Mining API



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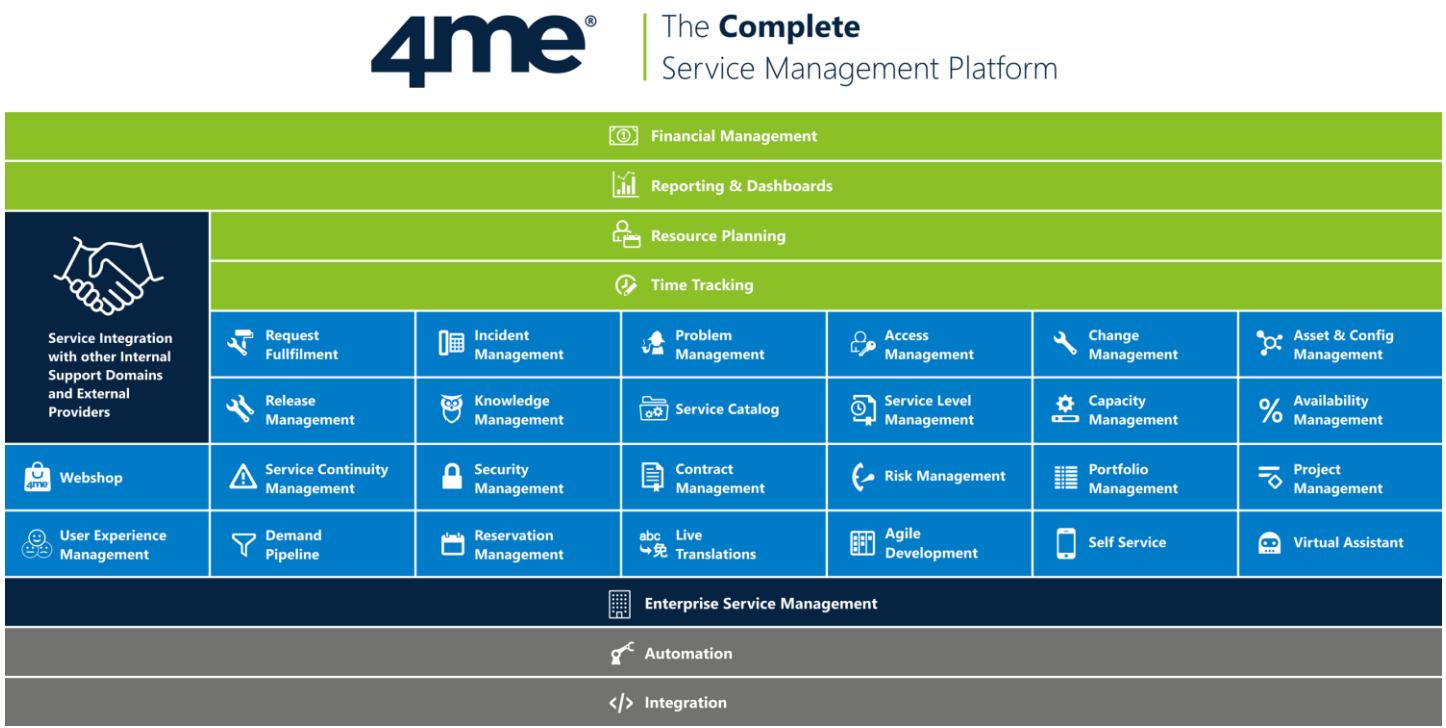
Analyzing process mining results



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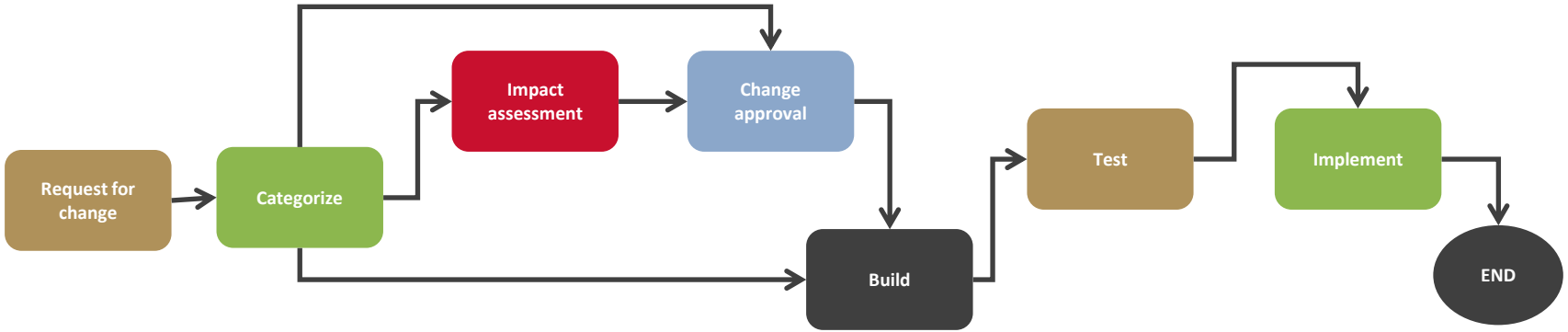
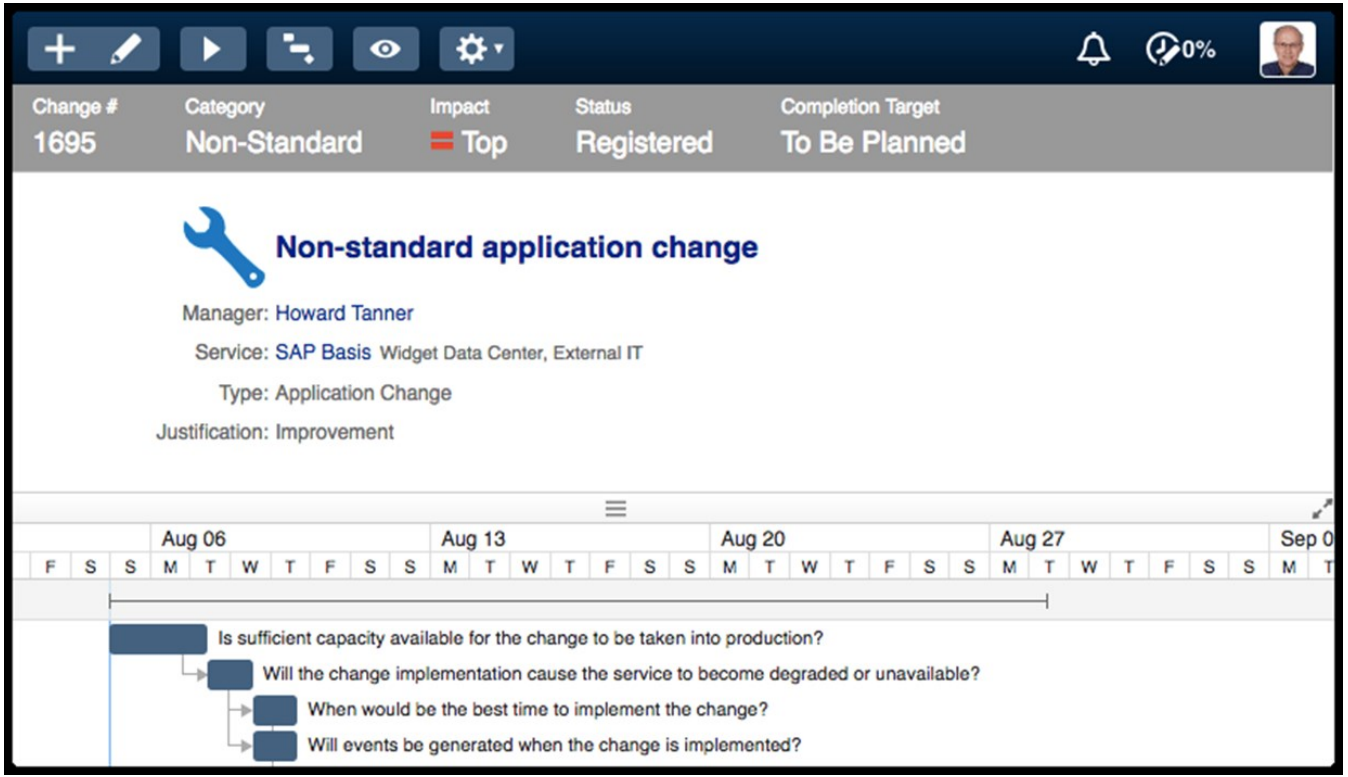
Process model for a change



Analyzing process mining results



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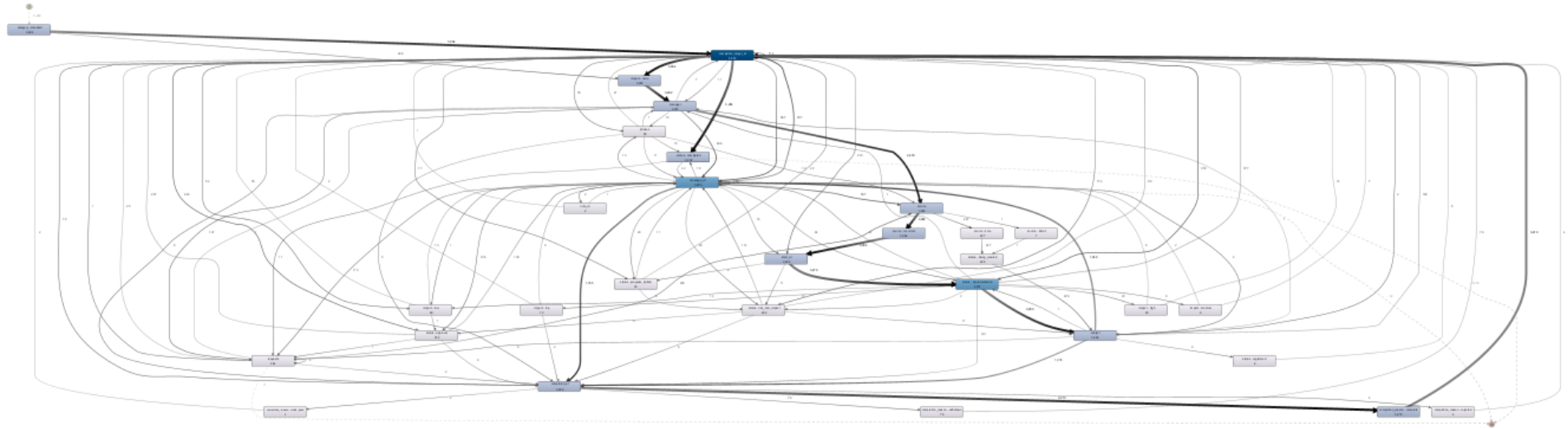
But actual data of all tickets is showing something else…



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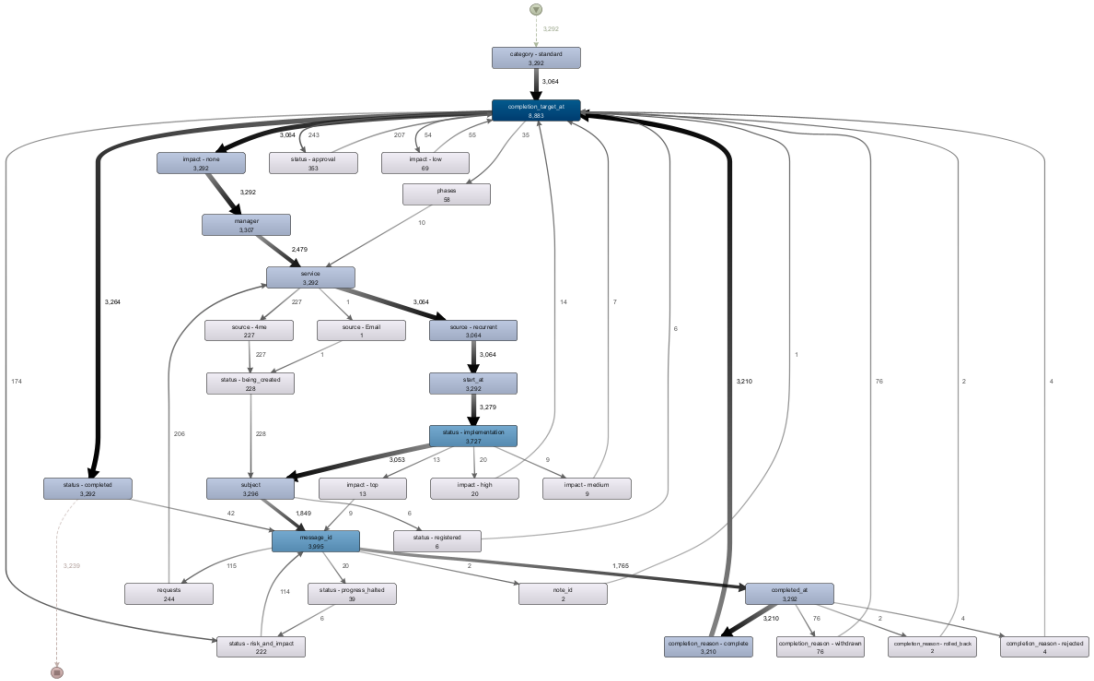

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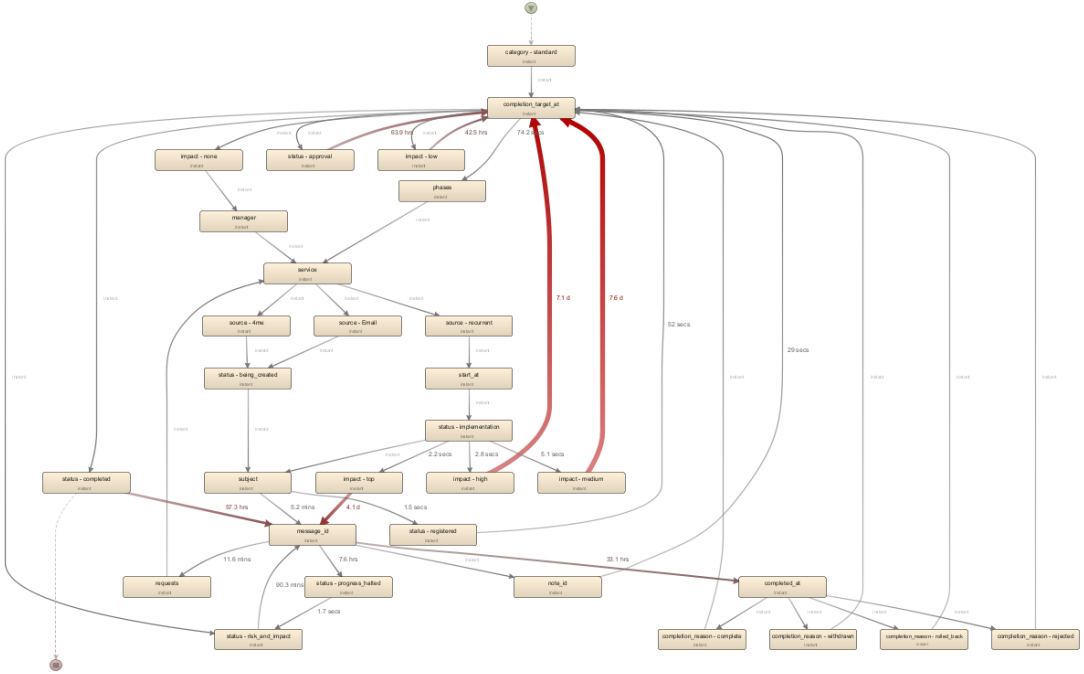

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But actual data is showing something else…

Always ask for the ‘Why’:

- Not all activities from the original process model pop up in the process mining analysis
- There is no standard order in which different activities have been performed
- Some steps between activities take much longer than agreed upon in the Service Level Agreement
- Etc
- Etc

Audit perspective: internal controls testing!

Defined Controls:

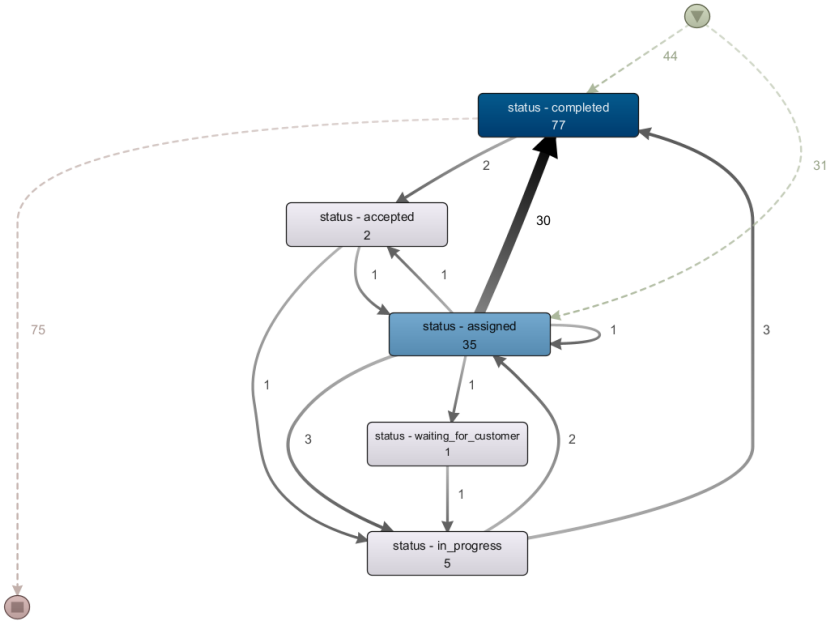
1. Changes are classified as standard or non-standard (normal or emergency)
2. In case of normal and emergency changes an RFC is made
3. Prior to implementing internal non-standard changes, approval of engineering team and CAB is required.
4. Prior to implementing external non-standard changes, approval of engineering team and client is required.

Research questions:

1. Are all changes classified as standard or non-standard (normal or emergency)?
2. Is in all cases of a normal or emergency change an RFC made?
3. Are all internal non-standard changes, prior to implementing, approved by engineering team and CAB?
4. Are all external non-standard changes, prior to implementing, approved by engineering team and client?

Incident management

Which statuses are being applied/neglected?



6 variants!

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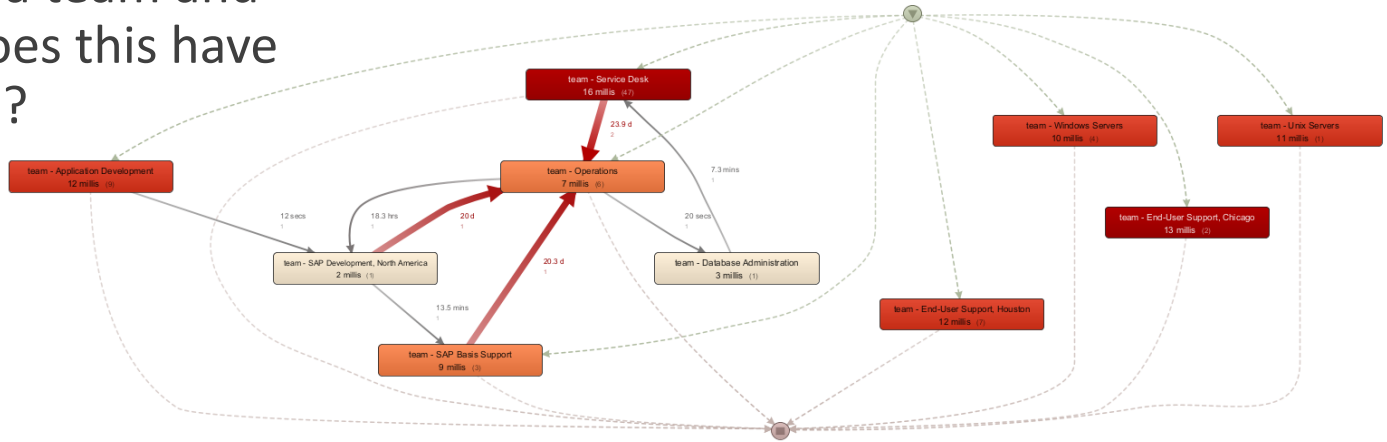
Incident management

To what extent are tickets (re-)assigned to a team and which impact does this have on performance?



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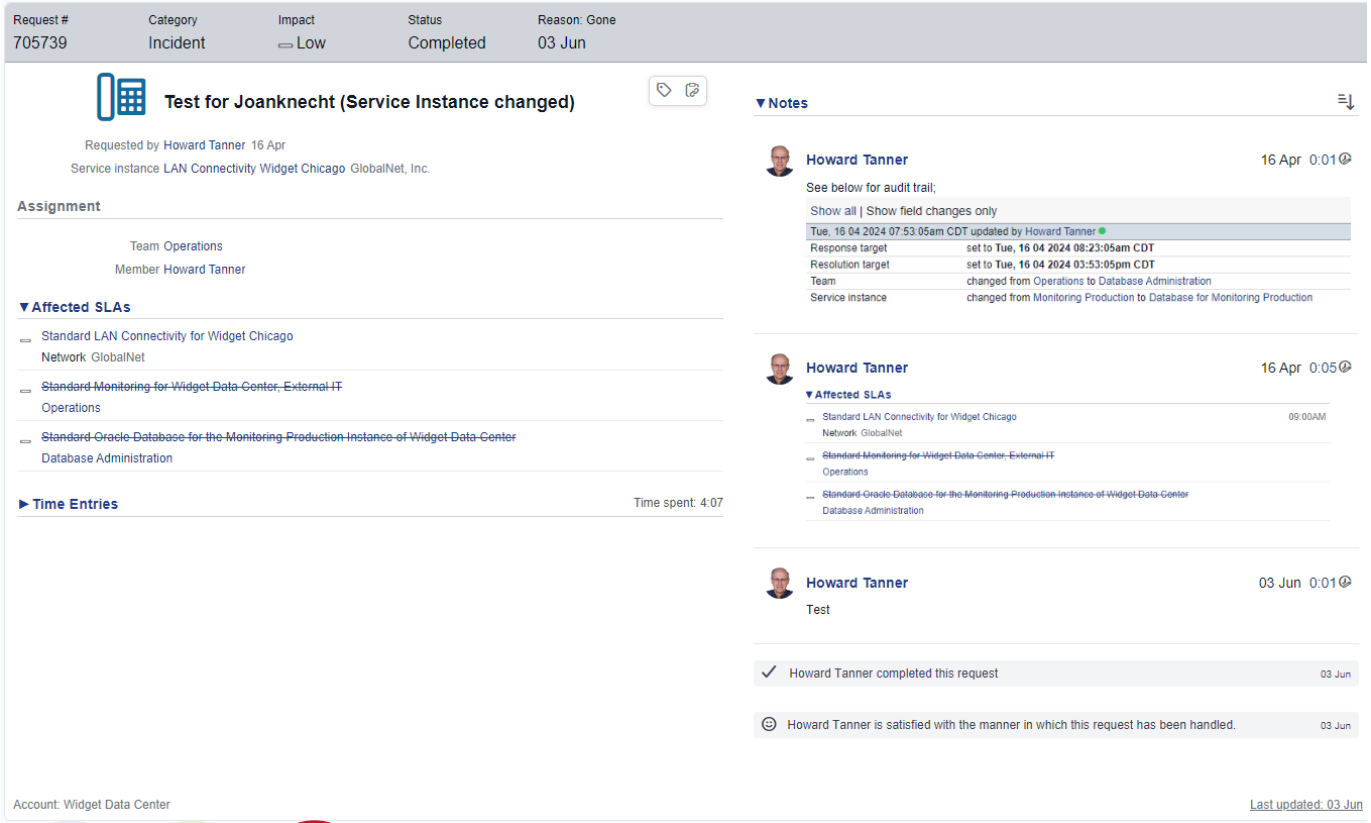
Analyzing process mining results



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Analyzing process mining results

Audit Trail - Request #705739 Test for Joanknecht (Service Instance changed)

Show all | Show field changes only

Mon, 03 06 2024 02:06:09am CDT updated by Howard Tanner	
Updated	changed from **Mon, 03 06 2024 01:58:44am CDT** to **Mon, 03 06 2024 02:06:08am CDT**
Satisfaction	set to **Satisfied**

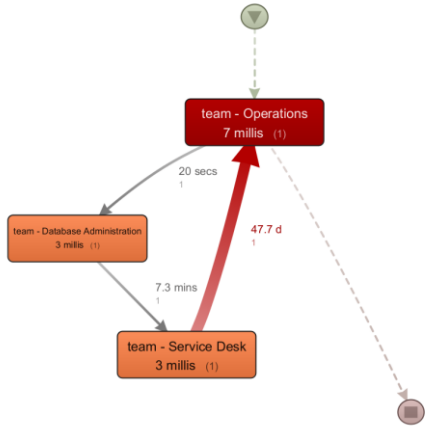
Mon, 03 06 2024 01:58:44am CDT updated by Howard Tanner	
Status	changed from **Assigned** to **Completed**
Completion reason	set to **Gone - Issue Can No Longer Be Found**
Completed at	set to **Mon, 03 06 2024 01:58:44am CDT**
Response target	cleared **Tue, 16 04 2024 09:00:22am CDT** and set to blank
Team	changed from **Service Desk** GlobalNet to Operations
Member	set to Howard Tanner

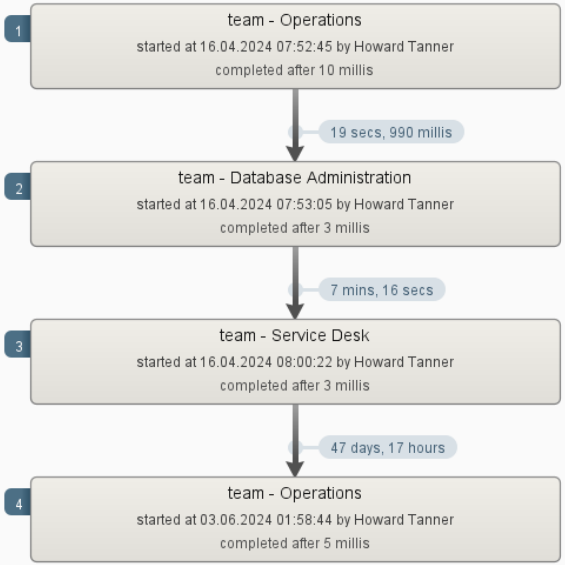
Tue, 16 04 2024 08:00:22am CDT updated by Howard Tanner	
Response target	changed from **Tue, 16 04 2024 08:23:05am CDT** to **Tue, 16 04 2024 09:00:22am CDT**
Resolution target	changed from **Tue, 16 04 2024 03:53:05pm CDT** to **Wed, 17 04 2024 02:00:00pm CDT**
Team	changed from Database Administration to **Service Desk** GlobalNet
Service instance	changed from Database for Monitoring Production to LAN Connectivity Widget Chicago GlobalNet

Tue, 16 04 2024 07:54:04am CDT updated by Howard Tanner	
Subject	changed from **'Test for Joanknecht'** to **'Test for Joanknecht (Service Instance changed)'**

Tue, 16 04 2024 07:53:05am CDT updated by Howard Tanner	
Response target	set to **Tue, 16 04 2024 08:23:05am CDT**
Resolution target	set to **Tue, 16 04 2024 03:53:05pm CDT**
Team	changed from Operations to Database Administration
Service instance	changed from Monitoring Production to Database for Monitoring Pr

Tue, 16 04 2024 07:52:45am CDT created by Howard Tanner	
Subject	set to **'Test for Joanknecht'**
Category	set to **Incident - Request for Incident Resolution**
Impact	set to **Low - Service Degraded for One User**
Status	set to **Assigned**
Source	set to **'4me'**
Grouping	set to **None**
Account	set to Widget Data Center
Created by	set to Howard Tanner
Requested by	set to Howard Tanner
Requested for	set to Howard Tanner
Team	set to Operations
Service instance	set to Monitoring Production





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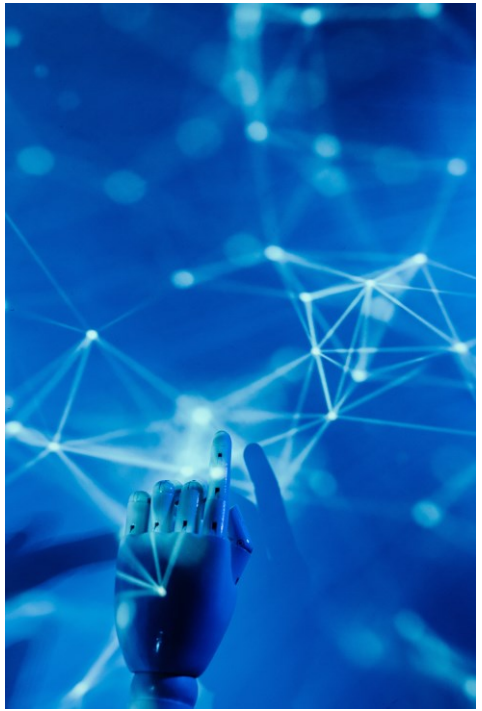
Process efficiency perspective: a real life example

- Overall 2948 fully completed cases during a full year -> average case duration 8,7 days
- In 48% (1415) of all cases minimum of 1 reassignment -> average case duration 10,9 days
- In 8% (227) of all cases minimum of 2 reassignments -> average case duration 27,5 days

Number of reassignments	Number of Incidents	Average duration (days)
0	1533	6,72
1	1188	7,73
2	127	19,50
3	44	27,36
4	20	26,96
5	13	44,48
6	11	37,03
8	8	83,12
7	2	52,46
9	1	38,39
11	1	227,53
Total	**2948**	**8,73**

Possible use cases for 4Me Users

- Incident management
  - Incidents are handled according to Service Level Agreements
  - Analyis of ‘Ping-Ponging’ with tickets between different employees and departments
- Change management:
  - Segregation of Duties in the change process
  - Analysis of waiting time between crucial activities
- Security management:
  - Analyzing behavioral patterns of logins etc.
- Process Health Check
- Etc, etc, etc



All use cases should be based on a specific need and research question!

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Any questions?

Please contact me at Lvousten@joanknecht.nl

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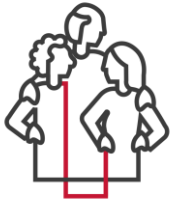
Assurance

IT-Assurance

Tax advisory

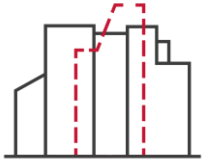


Family Services

IT-Services

Integrated Finance

Forensics and Recovery



Real estate advisory

Accountancy

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