How to add Process Mining to the Auditor’s toolbox

Turning Data into Knowledge
Disclaimer

Please note that the information on the following slides represent the personal opinion of the speakers. All information, graphics, etc. are either from test systems or are modified to highlight certain process steps.
Three lines of defence

1st line of defence
- Management control
- Internal control measures

2nd line of defence
- Risk management
- Financial control
- Security
- Legal
- Compliance

3rd line of defence
- Internal Audit

Source: Governance Risk and Compliance (GRC) technology: Enabling the three lines of defense
IIA Standards

International Standards by the IIA require the usage of data analysis
Institute of Internal Auditors Standard No. 1220.A2: „In exercising due professional care internal auditors must consider the use of technology-based audit and other data analysis techniques.“
Reversal of Audit Approach

- Manual testing (based on samples)
  - Traditional Approach
  - "Modern" Approach by using Process Mining and Data Analytics

- Data
  - Process Mining
  - Data Analytics
  - KPI

- System
  - System-Audit
    - Parameter
    - Customizing
    - SoD
    - ...

- Process
As-is Process visualization

Reduction of interviews with auditee and applying hypothesis free audit approach

What the auditee says ≠ How reality looks like


https://www.studycheck.de/blog/die-verruetzsten-baustellen-an-deutschlands-hochschulen
Necessary skills of an auditor

But also …

• Deep knowledge of underlying processes
• IT-skills especially in the area of ETL (Extract, Transform, Load)
• Understand the data (what field need what characteristic)
• Understand the systems (which system contains the needed information and how reliable are they)
• High analytics understanding (how can I create an event log; how can I join the data, ...)

• Last but not least: high level of frustration
Major advantages at a glance

- **Gain more objectivity**
  By applying a hypotheses free audit approach

- **Gain more effectivity**
  Reduction interview effort

- **Gain a higher level of confidence**
  Analysis of 100% available data (= population)

- **Targeted measures possible**
  Efficient realization of des highlighted (optimization) potential
How does it work?

- Find exceptions 
  “peel the onion”
- get the data
- keep an open mind
- be aware of the process in focus
Generating event logs from **flat tables**

<table>
<thead>
<tr>
<th>Invoice</th>
<th>Customer</th>
<th>Created</th>
<th>Amount</th>
<th>Approval</th>
<th>Items</th>
<th>PaymentTerm</th>
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**Conclusion:** Every field containing a date / time is a potential process event.
Now, let's peel the onion....

- eliminate all cases that are following the target process
- trim the process (start at destination sorting center)
- filter and improve all cases with data quality issues
- and let's do it all again...
Example: parcel delivery process

- Electronic item data:
  - Delivered by sender
  - Data used for special services during delivery (like cash on delivery)

- Origin sorting center:
  - Sorting of all parcels
  - Special handling for unreadable parcel labels

- Destination sorting center:
  - Sorting for delivery bases
  - Special handling for damaged parcels

- Delivery base:
  - Initial scan by the deliverer
  - Load parcel to the truck

- Delivery:
  - Over 55 different actions
How does it work?

- Communicate
- Find exceptions "peel the onion"
- Get the data
- Keep an open mind
- Be aware of the process in focus
Communicate your results!

- Describe the methodology
- Provide process overview
- Use visualizations
- Focus on relevant exceptions
Do a follow-up

How do the two processes compare?

Process A

- Receive invoice
- Check received invoice
- Final check of invoice
- Approve invoice
- Pay invoice

Process B

- Receive invoice
- Check received invoice
- Checked and approved
- Pay invoice

* Modified data to highlight process steps

Visualized by ProcessGold (processgold.com)
Executive **Summary**

- **Process Mining** is a technology innovation that has established itself as a new category in big data analytics methodology.

- **Process Mining** is living digitization: It uses all digitally available information in the company and enables the derivation of concrete measures.

- **Process Mining** allows you to track your business processes, check for deviations, track down risks, and enforce compliance policies.
Thank you and keep on mining

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