## Process Mining

A step-by-step guide to optimize your processes.

### Define

**Define**
Define the problem, goal, stakeholders, and critical process output.

1. **Process Selection.**
   Select the process to be analyzed. Consider the following criteria:
   - Data availability: Is enough process data with time stamps available?
   - Management: Is there support from management? Are sufficient resources available?
   - Potential: Where can the biggest improvements be made? Which process offers the most added value for customers?

2. **Integration of a reference model.**
   Determine whether a reference model of the process already exists. If no model exists yet, it can be created here manually or generated in Step 8.

3. **Process-related questions.**
   Specify the question or questions to be answered in the process analysis.
   - How good is the process performance?
   - How standardized/automated is the process?
   - Does the process meet your requirements?
   - What is the optimization potential?

4. **Relevant stakeholders.**
   Ensure that all process participants are involved in the project.
   - Process owner
   - Process manager
   - Data owner
   - Specialists and system experts
   - Decision makers

### Measure

**Measure**
Extract and transform the data.

6. **Data and data sources.**
   Check which process data is available. Where is it located? How can it be used?
   - Data type/format
   - Storage location: system/database
   - Mapping of time stamps to activities

7. **Data extraction and transformation.**
   For a process mining analysis, the process data must be prepared as event logs. Check whether the log files contain at least the following: case ID, activity name, start and end times. Additional attributes are optional.

8. **Data import and processing.**
   Load the transformed data into the tool. It automatically generates a model of the actual process (model discovery). If no reference model was available in Step 2, create a model of the target process in the process mining tool.

### Analyze

**Analyze**
Pinpoint problem areas using process data.

9. **Model enhancement.**
   Model enhancement describes the analysis and evaluation of the generated process model based on the following factors:
   - Process duration
   - Frequency of unexpected process steps
   - Distinctive process sequences

10. **Conformance checking.**
    In conformance checking, the generated actual model is compared with the target model (Step 2 or Step 8). Use this to detect deviations and check conformity.

11. **Root cause analysis.**
    The process-mining-supported root cause analysis studies concrete process deviations in detail. Use it to identify problematic attributes, patterns in deviations, and indicators for effective optimization.

12. **KPI Analysis.**
    Evaluate your process data using dashboards that provide visualizations of the relevant KPIs (Step 5).

### Improve

**Improve**
Develop and implement solutions.

13. **Addressing the issues.**
    Based on your findings, determine which optimization measures best suit your needs. Examples include:
    - Business process automation
    - Additional training
    - Greater standardization and harmonization
    - Implementation of new/additional IT systems
    - Adaptation and optimization of process flows

14. **Solution implementation.**
    Work with the team and all relevant stakeholders (Step 4) to put your solutions into practice.

15. **New reference model.**
    Replace your earlier reference model (Step 2 or Step 8) with the current, optimized process. This will be your new reference model and serve as the basis for comparison during future optimization efforts.

### Monitor

**Monitor**
Test solutions for long-term usability.

16. **Success of goal achievement.**
    You can gauge the success of your optimization efforts by revisiting the questions asked in Step 3.
    - Has process performance improved?
    - Are the process runs meeting expectations?
    - Have all the desired corrections been made?
    - Have you maximized all optimization potential?

17. **Evolution of the new process.**
    It’s important to reevaluate your newly optimized process. We recommend the following steps:
    - Re-extract the process data and feed it back through the process mining tool.
    - Analyze the current process against the KPIs defined in Step 5.
    - Compare the new, optimized process against the latest version of the reference model.