

Step-by-step Activity-based Costing & Process Mining

You can get a clear picture of costs associated with the activities in your process if you combine the Activity-based Costing method with Process Mining. After discovering all steps in the process, including the time spent per person, you calculate associated costs and added value. These numbers help you to understand the distribution of indirect company resource consumption costs along dimensions like IT or staff. You can further enrich your data with attributes like the origin of cases, sales channels, or specific campaigns. Knowing the end-to-end performance of core business processes and the determinants of observed behavior, you find organizational levers to build your case for change.

This handout provides instructions for my approach to combining Activity-based Costing with Process Mining. Disclaimer: the example is solely based on personal interpretations.

Steps	Example of Consumer Loan Provisioning
1. Identify core competence of company: <ol style="list-style-type: none"> main service that generates the income; activities done by whom, what roles; money flows, who pays who for what. main KPIs, what is on executive agenda <i>Find subject matter experts, company policies, maybe even process diagrams.</i>	Receive leads for loan applications, qualify lead information, evaluate loan capacity, decide offering (accept or reject), set price, issue offer, call, receive signed offer, initiate contract, receive installments, handle Q&A, pay provisions, terminate, settle or write-off contracts, manage arrears and collections
2. Go to Gemba (walk to operations department, observe, talk to people)	Familiarize, make contact, 'feel the factory', what is exchanged on the floor, what strikes
3. Now answer four questions: <ol style="list-style-type: none"> What do you consider as a case; Where does the work really start; Where does it end (what final activity exists); Again: what KPIs show pains and gains? 	<ol style="list-style-type: none"> Case: loan application by consumer Start: lead visits website of intermediary End: rejections, no-shows, successful loan contract ends (repaid, settled, write-off) KPIs: production volume, handling time, Break-Even-Point, contract duration
4. Make inventory of applications used, preferably also by whom <i>Consider consulting your privacy officer!</i>	Midoffice, contract administration, financial applications, risk evaluation, and pricing engine; roles associated as per organigram
5. Get access to process data, identify at least cases, activities, and timestamps of both pre-contract and in-contract phases of total customer life time	Apply SQL muscles to several databases and partially join them to get datapoints of single cases, joined sales channel, overcome data quality issues with floor agents plus IT
6. Obtain an event log and discover model	Formatted outcome step 5 as input for Disco
7. Get access to financial data	Relate won contracts with influx of interest and spend on provision, include translation of rough indirect costs of IT as % of capacity consumed from total agents FTE.
8. Make the business case	Rank sales channels by cost-benefit ratio, explain cost drivers impact on KPIs and why some intermediaries outperform the rest

Some extra tips regarding data quality

Checking the data quality is essential for any process mining project. Validating the data is even more relevant if you use it as a basis for cost calculations. You will need support from your functional maintenance colleagues who know their applications and the infrastructure they run on. Collecting timestamps associated with activities of a specific case is good practice, but check if the activities always follow a natural order. For example, we once found that by distributing the digital work within one application over several nodes, the [internal clocks of these nodes were different](#).

[Missing end points](#) can be explained by consumers not following through to a normal end point, like a signed contract state or active rejection by the loan provider. This results in no-shows at certain steps in the loan application process. Think of not returning an offer or stopping communicating after an inquiry about missing financial documents in the dossier. You can discard unfinished journeys or work around them. If you include them, discuss with the agents on the floor what an acceptable wait time is [before synthetically adding an endpoint](#). If you don't do this, the process mining software will just draw a dashed line from the last activity to the general end point, which makes your analysis more complex. Base the trade-off on the KPIs you questioned: if no-shows are a headache, you might want to know where it happened, how often, and how much work has already been done (consider this waste).

One last tip is about applications that allow agents to pause or hand over activities to others. Within the database of such an application, you look for `datetime_starts` (when exactly an agent started an event) and, if you are lucky, the application also registers `datetime_ends` (when exactly an agent ends an event), so pauses can be distinguished based on status changes:

- consider the first and the last data points of an activity as `datetime_start` and `datetime_end` of the whole activity, which is probably ugly and accumulating waiting time that should not be used in staff cost calculations, but it is fast;
- or wrangle your data so that only work time is calculated per iteration of a `datetime_start` and `datetime_end`. You now get a lot of repeat flows per activity in the visual representation, which is fine, but it leaves out visual inspection of how many cases go through n-amount of repeats (some first time right, some need two times, some ten times asking for documents or calls for interviews, etc.). [You can overcome that by adding a repeat number to the name of the event](#) to distinguish each passing (for example, repeat activities of “call customer” become “call customer-2” and “call customer-3”). Visual inspection really helps in understanding the repeat flow: is it equally distributed or skewed for some reason? Show it to your stakeholders.

Have you tried the approach yourself?

We are looking forward to hearing from you! You can [contact Fluxicon](#) and you can [find me on LinkedIn](#). We hope you will share your learnings within the [Process Mining community](#).

You can watch our discussion and a concrete example of this approach in the recording of the Process Mining Café from 13 December 2023 at <https://fluxicon.com/blog/2023/12/process-mining-cafe-27-recording/>

We believe that Activity-based Costing and Process Mining are a great match. If you have questions or need assistance, please let us know!