

# Accelerating Process Modeling with Process Mining

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# About the author



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Sandy is an industry analyst and technical strategy consultant specializing in digital process automation. With many years of hands-on systems implementation experience, she works with large organizations on their digital transformation strategy and implementation projects. She writes a popular process management blog at [column2.com](http://column2.com), is a featured conference and webinar speaker on process automation and digital transformation and is a contributing author to books on social BPM and adaptive case management. Sandy is recipient of the 2019 Workflow Management Coalition's award for Outstanding Business Transformation Consultant.

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## Introduction

Process modeling (or mapping) is a fundamental part of every business analyst's work. The analysis of a business operation starts with a model of how work flows between people and systems, and the tasks that are performed along the way. Usually, these models are created by business analysts who interview subject matter experts, observe human activities, read through system manuals and procedure guides, then manually draw their understanding of the process. The models are used by business people to understand their operational procedures and plan performance improvements, and are also a communications tool between business and IT teams when discussing system changes and upgrades.

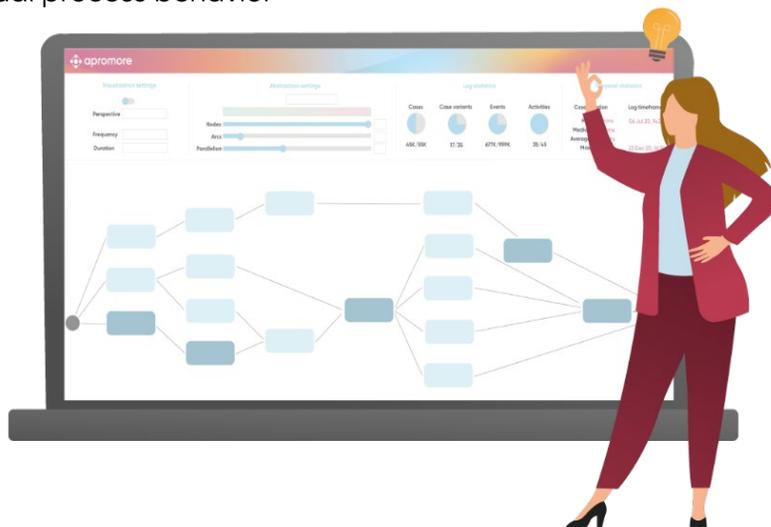
The problem is that these models are almost always incomplete, imprecise or incorrect (or all of the above). They represent a human interpretation of what the process does, or what the related systems were originally developed to do. They don't show what the process actually is, or how it is deviating from best practices. Well-crafted process models can be insightful and useful for communication and discussion, but they provide little solid analytical basis for improving performance or understanding emergent behavior.

Process mining, on the other hand, directly captures the actual process behavior

based on the log files of systems that people use to perform work, turning tacit knowledge into explicit knowledge. This can be used to validate – or even generate – process models, identify conformance issues that increase business risk, and model performance optimization.

Process modeling and process mining are complementary, not competitive, techniques: a business analyst needs both in their toolkit. Process mining provides exact models of the system-based portions of processes, while manual modeling and analysis captures human activities, documents informal procedures, and identifies the many ways that people “work around” systems.

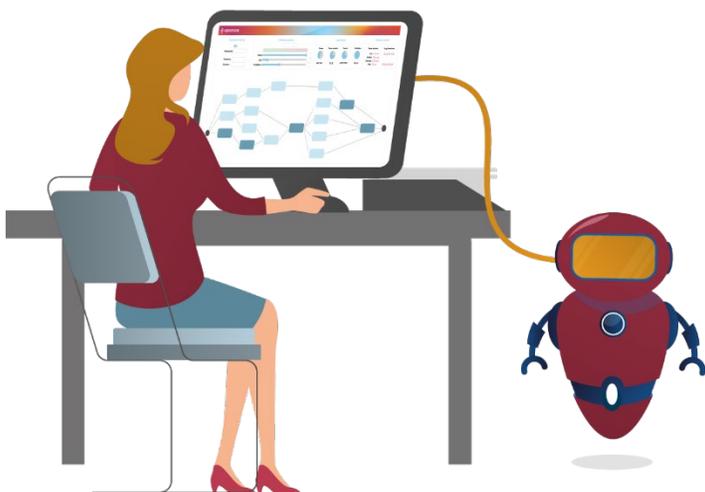
This paper looks at the complementary nature of these tools and techniques. For business analysts, this means how they can use process modeling and mining together to accelerate their analytical efforts. For business architects, process mining provides traceability from top-level business objectives and models to lower-level processes and individual work activities. And for business leaders and operational managers, the combination of more traditional process modeling with process mining can pinpoint potential governance and compliance violations while providing clear guidance on performance improvement.



## The Drive Towards Analytical Techniques

Analytical techniques in process discovery and improvement, including process mining and simulation, have been available for many years. In the past, however, they were used primarily by people with a technical analytical background. The current business environment and technological advances have pushed these analytical tools into the mainstream, where they are being recognized as essential for all levels of business analysts. Although we tend to attribute all business and technology changes in these times to the pandemic, there are many complex factors involved in this move to analytical techniques for process improvement:

**Work has become more automated.** Many business processes are supported completely by computer platforms, although they can include multiple systems in a single process. Some are automated, and the non-automated steps are delivered to a worker using the technology platforms. This means that most of the activities in these processes are captured in some way by a system, creating a record of work passing between people and of tasks being performed at each step.



**Work has become more changeable.** The pandemic forced many businesses to shift their business models and rework their disrupted supply chains, but this was already occurring due to globalization and competition. New nimble competitors are creating business models that challenge incumbents with the ability to change their processes and supply chains frequently to adapt to changing conditions.

**Work has become more distributed.** Processes have changed drastically, supply chains have been interrupted, and many processes now include workers distributed across multiple locations. This is due in part to the pandemic forcing remote work and closing physical facilities, but also to globalization and the need for flexible supply chains to serve changing business models. A single process that used to occur within one office may now have participants across the country, or even around the globe, and managing these distributed processes requires additional coordination and oversight.

**Work has become more complex.** With greater automation, constantly changing processes and wider geographic distribution, an end-to-end core business process can be too complex and too volatile for any single person to have a detailed understanding of it. Static process documentation based on manual information gathering will not reflect the current state, or be useful for process improvement. Furthermore, manual analysis methods such as job shadowing and in-person interviews are hampered by a distributed workforce. Business analysts traditionally use these techniques to discover and document processes, but with workers in multiple geographic locations, exacerbated by pandemic restrictions on personal interaction, this is often not possible.

In short, today's business processes can't be properly analyzed and improved using

only traditional manual methods: semi-automated analytical methods including process mining and simulation must be combined with manual methods to get the full picture.

## Process Mining and Modeling for Business Analysts

The key focus for many business analysts is to create business documentation using process modeling tools and text-based description, rather than performing in-depth analysis of business processes. Documenting current processes and procedures in this way has value, but it's not really analysis, and it is unlikely to discover opportunities for radical improvement.

Business analysts gather information through observation: job-shadowing to document task procedures and the human-computer interactions, interviewing teams about operational processes, or viewing operational metrics. Because this is based on only the worker use cases plus subjective interpretations of the overall process, the result is an incomplete – or even incorrect – view of what actually happens, and little insight into how this links to overall business performance.

To complement their manual documentation and analysis tools, business analysts can use process mining for creating an “as-is” model of processes that are supported and automated by enterprise systems, since the activities of those processes are captured in the log files of the systems involved. The advantage of using process mining over manual process modeling is that it's data-driven: the processes discovered are the actual operational processes, including automated activities and human-computer interactions, not an

interpretation of those processes. This includes statistical information on the frequency and duration of each activity and pathway in the process, allowing for much more detailed analysis based on the data.

But process mining can go far beyond just creating a model of the current-state process: because it's based on the actual record of many individual transactions and may combine data from multiple systems, it allows an analyst to explore the model in ways that aren't possible with static process models. Process mining tools show all the different ways that the process actually executed, and help identify the reasons for the variations from the expected process. Data-driven analysis techniques including conformance checking and root cause analysis are then used to find the problems in the processes, and what is causing them. This locates problems such as places in the process where compliance controls were bypassed, or where the same transaction unnecessarily repeats a loop between the same group of workers several times before completing.

Process mining tools can also be used to explore “what if” scenarios for predicting what would occur if the process changed in some way:

- Where would bottlenecks form if our throughput volume was drastically increased?
- What resources would sit idle if it was drastically decreased?
- If two parts of the process ran in parallel, how much would that decrease the cycle time?
- If a human task was automated using robotic process automation, how much time and money would that save?

Since data about time spent by workers in the process is captured in the model, this

can translate directly to calculating trade-offs in costs and cycle time, and figuring out the best way to allocate resources within processes.

Past generations of process mining tools were used primarily by technical analysts with a deep understanding of the underlying algorithms. This created a barrier for business-oriented analysts who have a deep understanding of the business, but less formal mathematical or technical background. The current tools, however, make the capabilities much more accessible and usable by a broader audience: users still require analytical skills and process knowledge to guide the analysis and contextualize the results, but don't need to be a data scientist to reap the benefits. Process mining is no longer a tool for specialists, but a self-service capability for any business analyst.

The ideal scenario for a business analyst, then, is to combine their knowledge of business and their manual documentation skills for task procedures with the powerful analytical capabilities of process mining and simulation. This allows them to create a complete and accurate picture of the current state – including all of the variations and potential compliance risks – and detect where changes to the process can have the most beneficial business impact. Having an understanding of the

manual procedures for individual workers against the background of the overall process flow also allows them to suggest additional areas for automation of routine activities.

## Process Mining In Goal Traceability

Although process mining is a powerful tool for business analysts as described above, data-driven analytical tools have direct benefits to business architects.

Business architects are concerned with the traceability of business objectives: being able to identify top-level business goals, map those to departmental or business capability goals, then directly to metrics at the operational process level. Once executives agree on corporate goals, that traceability ensures that processes are designed to work towards those goals, and the front-line workers are being rewarded for performing tasks that contribute to the goals. Without that, those goals will never be achieved, since no one will be doing the actual work to make them happen.

Traceability is also important from the bottom up: the tasks that the workers are performing and the detailed steps of the operational processes need to map upwards towards corporate goals. If that traceability isn't there, then there are likely operational processes and worker tasks that are completely unnecessary, hindering productivity.

Having fully detailed process data based on thousands (or millions) of transactions, business architects can use the same analytical techniques in a process mining tool as business analysts use, but with a focus on larger goals. This requires that the higher-level corporate goals also be data-driven and measurable. For example, top-level goals for revenue may be tied to lower-level KPIs such as operational costs and fulfillment cycle time. Being able to



model the trade-offs between the KPIs allows the business architect to determine what changes in the operational processes would be required in order to maximize the top-level goals.

## Process Mining for Operational Management

The analysis provided by process mining can have far-reaching impacts for operational managers since it provides total transparency into how their processes actually work. With broad knowledge of their own business area, operational managers can interpret the analysis for the purposes of continuous improvement beyond just process improvement:

- **Conformance checking**, which compares what's actually happening in a process against what is expected, can be used to identify training opportunities for certain roles or workers.
- **Cost/resource trade-offs** can be used to make decisions about outsourcing.
- **Expected bottlenecks under increased load** can be used to make decisions about staff level increases during seasonal peaks.
- **Identifying sources and cost of waste** can be used to improve quality management and reduce defects.

Process transparency and conformance checking is also useful for supporting compliance audits. Auditors can look at the frequency of different types of compliance violations, and drill into specific transactions to understand the root causes.

## Summary

With today's highly complex and volatile processes, organizations need much greater analytical strength to understand how their business actually works, and how to improve it. These processes are too complex to analyze using manual methods alone, and business analysts need to use data-driven analytical methods such as process mining in combination with manual methods for the best results.

Having data-driven analysis as part of business process analysis also allows business architects to determine goal traceability, and provides managers with a rich set of information for making operational decisions.

## Want to know more? Ready to explore the potential of Process Mining?

At Apromore, we are committed to creating business value by helping our customers to embed process mining in their continuous process improvement initiatives. If you are interested in the possibilities around how process mining accelerates process modeling, **reach out to us.**

## Want to know more?

Are you interested in process mining and the endless opportunities that arise from its implementation?

Reach out to learn more!

[Book a demo](#)

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