What's next in process mining - evolution and innovation

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SUMMARY:

Process mining has grown by leaps and bounds over the past decade. What happens next? Prof.dr.ir. Wil van der Aalst, Chief Scientist at Celonis, looks at how the technology is evolving and helping businesses find and capture the value hidden in their processes.

From touchdown to takeoff, dozens of events must happen at the right moment and in the right sequence for a flight to depart on time. The plane must arrive at the gate–one event. Deboarding must start and end–two events. The cleaners must arrive, begin cleaning the cabin and finish–three events. Bags must be unloaded and loaded, fuel ordered and taken on, boarding started and finished, catering completed, doors secured, push back requested, on and on.

These individual events make up the complex, interconnected processes of modern airline ground operations. Get them right, and flights leave on time, customers are happy and costs are controlled. Get one of them wrong, and the opposite happens.

For decades, airlines used manual process optimization techniques (e.g., workshops, whiteboards and interviews), to streamline their operations. Today, leading airlines use a faster, more cost-effective, data-driven approach, and one that enables continuous improvement. They use process mining, a technology that enables organizations to find and capture the value hidden in their processes today and is positioned to become the trusted, daily business assistant of tomorrow.

Modernizing process discovery, enabling continuous improvement

Process mining was born in the late 1990s in large part as a reaction to the limitations of traditional business process management (BPM) and process discovery techniques. Manual process discovery involved hiring consultants to conduct user interviews and employee workshops, talking with subject matter experts and process stakeholders, digging through documentation and mapping processes on a whiteboard. This is a time consuming and expensive process that captures a process as it exists at a single point in time.

[Process mining modernizes process discovery](#) by creating models using event information extracted from business information systems (ERP, CRM, SCM, etc.). The data is stored in event logs and analyzed to create objective, data-driven models that show how processes actually work, not how people think they work. With process mining, we no longer have to waste time and money creating BPMN (business process management and notation) models that say little about the actual processes. Process mining also allows for continuous process monitoring and optimization.

Turn process insights into targeted action

Modern process mining solutions, like [Celonis EMS](#), bring together streaming data, process intelligence, [automation](#) and a [consumer-grade user experience](#). Gartner in its first [Magic Quadrant™ for Process Mining Tools](#) wrote:

Process mining tools deliver visibility and insights to technology innovation leaders that enable smart decision making and strong performance on an organization's critical priorities.

By 2025, Gartner believes that 80% of organizations "will embed process mining capabilities in at least 10% of their business operations."

I see no reason that this growth will slow anytime soon. Process mining is a technology that any organization can use and use cases cut across business functions, such as [procurement](#), [accounts payable](#), [accounts receivable](#), [inventory management](#), [order management](#), and [IT service management](#).

Process mining innovations powering business performance

Process mining is a mature technology being used by companies all over the world, but that doesn't mean there aren't exciting innovations happening in the field. Two recent advancements are [object-centric process mining](#) (OCPM) and the use of large language models (LLMs).

Traditional process mining techniques are focused on a single process in the context of a single object. For example, you can look at how a sales order (the object) moves through an organization to examine the order management process. Although effective, this approach is limited. If you want to look at the same process using a different object (shipments, items ordered, customers, etc.), you need to do a separate data extraction and analysis. Classic process mining can't capture the complex interactions between multiple objects. OCPM can. It's like going [from a two-dimensional X-Ray to a three-dimensional MRI](#).

Another exciting innovation is the combination of LLMs with process mining. During its [World Tour 2023](#), Celonis announced LLM for PQL Generation, a new artificial intelligence tool created in partnership with Rollio. LLM for PQL Generation (currently

in beta) translates user queries and statements into Process Query Language (PQL), the programming language that Celonis EMS uses to analyze process data.

For example, an analyst within the Finance team could enter the question, "What is my overall AP automation rate?" into a familiar chatbot style interface, and Celonis will provide the answer. This natural language interface democratizes the power of process mining, by allowing non-technical, business users to gain insights from the platform–no code required.

Real-world results: More on-time flights

At the beginning of this article, I used an airline's ground operations to illustrate how process mining can be used to optimize highly-complex business workflows. This example was grounded firmly in reality.

In 2020, Lufthansa CityLine was recognized for using Celonis to improve the punctuality of its flights by 300,000 minutes. This improvement meant that the "overall customer experience of approximately 8 million passengers that departed with Lufthansa CityLine in 2019 was significantly increased."

In addition to using process mining for ground operations, Lufthansa CityLine also applied Celonis to its Technical Fleet Management–the process of aircraft maintenance. The airline was able to reduce delays in maintenance work by 15%.

Speaking about Lufthansa CityLine's use of Celonis, Philipp Grindemann, Head of Business Development and Project Management, for the airline said:

Celonis helped us to get transparency into the fueling, catering, and boarding processes to align speed and to get every process on time ready so that the aircrafts can depart on time.

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