

# Business Miner: Process Mining Insights for Business Users

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## Abstract

Despite the increased maturity and demonstrated success of process mining across various industries and process domains, barriers for non-technical users to benefit from process mining applications persist. In this demo paper, we introduce Business Miner, a question-based application that allows non-technical users to apply process mining without requiring technical skills or training. Based on the underlying process data, users are presented with questions that range from explaining the process to surfacing process improvement opportunities. Finally, users can capture content from the question-answer thread and collaborate with colleagues on insights.

## Keywords

Process Mining, Question-based, Business User

## 1. Introduction

Today, the continuous execution of processes within companies generate a tremendous amount of data. To extract value from this data, companies employ process mining tools that enable their organizations to discover insights about processes and improve them over time. While intended for every business function, these tools are often used foremost by individuals who have the technical skill to prepare and analyze data, such as data engineers and data analysts. Those with the most relevant business knowledge about the process are often not well-equipped to use process mining tools. Until now, to make process mining insights consumable, major process mining vendors have provided tools to enable technical teams to build dashboards or reports for business functions to consume. There are drawbacks to this division of tasks between technical areas and subject matter experts such as time lags between data capturing and insight creation or nuances that get “lost in translation” during data preparation and business object definition. Accordingly, those who are in the best position to make decisions based upon the analysis that comes from the use of process mining tools, often do not get the information as quickly as needed. The value to be derived from the use of these tools thus suffers. Unsurprisingly, a recent Delphi study suggests alleviating access barriers of process mining data as a fruitful opportunity for the commercial use of process mining [1]. Moreover, research has shown the

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many business-relevant questions that process mining technologies and methodologies can answer today [2]. These are not only theoretical, but grounded in real-world industry processes, as seen in a case study in a healthcare setting [3]. On a similar avenue, we saw the first attempts to apply natural language processing to process mining based on a collection of 749 questions [4]. In this demo paper, we introduce Business Miner, a question-based and guided experience within Celonis to address the access barriers for users without a technical background.

## **2. Core Features**

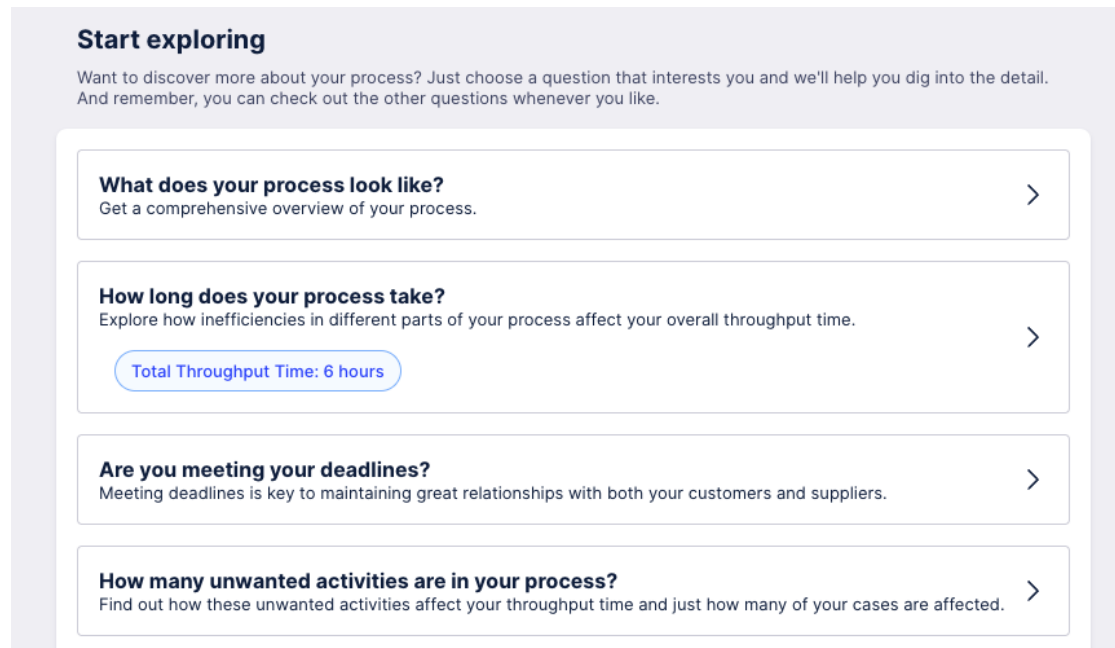
Business Miner is a process mining application targeting novice or non-technical users enabling them to understand their processes, dive into business-relevant KPIs and capture insights that can lead to process improvements. In this section we outline its core features along the user journey.

### **2.1. Data Identification**

The user can choose the process of interest out of 16 available processes. For every process, requirements on needed tables and columns are predefined and all available data models are checked automatically by the tool. These requirements for data models are derived from the KPI definitions formulated in Process Query Language (PQL) and stored in a business knowledge pool. Once the automatic data validation is performed, the user is presented with a list of suitable data models to select as the basis for the guided exploration that is automatically generated in the next step. Even though the tool tries to hide the complexity of preparing the data from the user, it presents the outcome of the data identification process transparently. Core parameters such as the resulting number of cases and activities as well as a case table are presented.

### **2.2. Questions and Answers Thread**

After selecting the data source, Business Miner provides users with recommended process-specific questions. These questions were compiled by interviewing process mining professionals and cover standard process mining use cases such as discovering the process by displaying its flow, identifying common paths and deviations, and improving process efficiency by shortening throughput time or reducing unwanted activities. Additionally, there are process-specific questions tailored for Accounts Payable (AP), Order Management (OM), Accounts Receivable (AR), and Procurement. They range from descriptive to explanatory to recommendatory questions such as "How long does your process take?", "What drives manual processing?" and "How can you reduce late deliveries to improve on-time payment?" respectively. Depending on the user's chosen starting question, the tool uses a decision tree algorithm to suggest relevant follow-up questions. Questions are grouped together by use case, i.e. questions around the KPI Touchless Order Rate belong to the same tree. In addition, a hierarchy exists between questions of one tree, where recommendatory questions are children of explanatory questions which are children of descriptive questions. To choose which questions to recommend, Business Miner looks at unanswered questions linked to the current question. First, unasked children questions are



**Figure 1:** Screenshot of the user interface: Selecting a question

suggested since the tool wants to move from pure process descriptions to actionable recommendations for the business users. Second, unanswered sibling questions are proposed followed by higher-level questions belonging to the same parent.

Every answer contains a predefined set of visualizations to convey the information in a guided way. The components are interactive and can be customized by the user; they include Process Explorers, KPI cards, tables, charts and many more. For instance, the users can sort a table, choose by which dimension to drill down or export the data. Through a central filter bar, users can filter down the visualizations of the question-answer thread by relevant time dimensions and process-specific attributes.

### 2.3. Insights Capture and Collaboration

Business Miner allows users to capture data visualizations from one or multiple question-answer threads and discuss insights with colleagues. When insights are captured, the underlying data, visualization state, and applied filters are frozen in time, ensuring the preservation of the insight. The link to the source of the capture persists and the user can jump to the origin question-answer thread showing live data but the preserved component settings and filters applied. Multiple users can add snippets from multiple explorations to one insight at different points in time. They can also add descriptions, comment, update the status and share the insight.

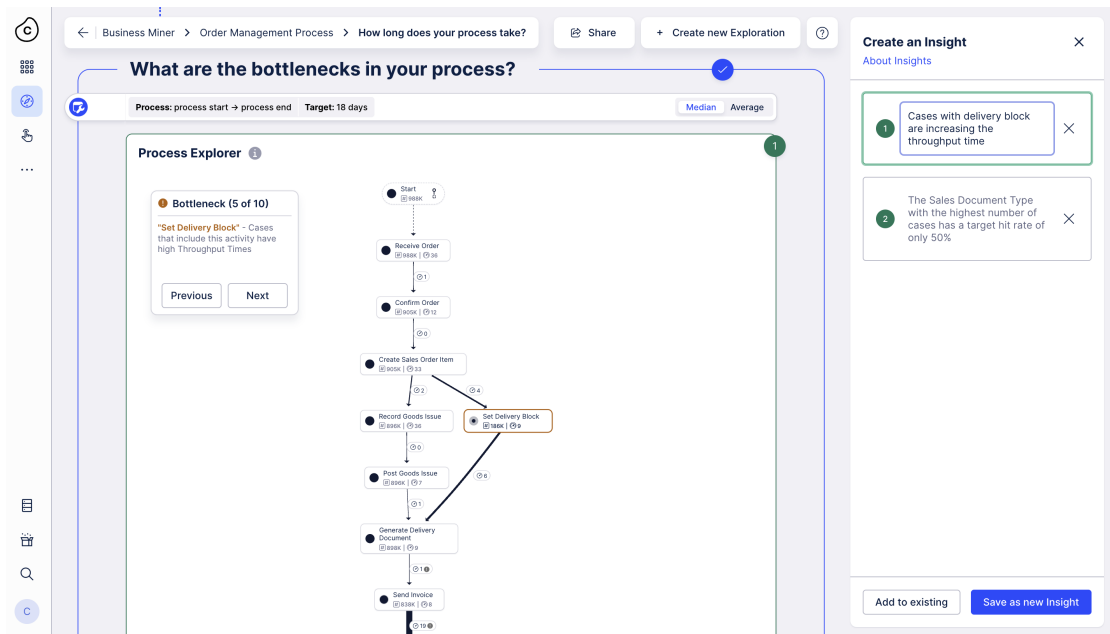


Figure 2: Screenshot of the user interface: Capturing an Insight

### 3. Availability

Business Miner has been available to all Celonis customers since November 2022 and is natively embedded in the Celonis Execution Management Platform. It is also accessible to academics and practitioners in a limited version through the Celonis Free Plan<sup>1</sup>. A screencast<sup>2</sup>, documentation<sup>3</sup> and training material<sup>4</sup> are available. Since its launch, hundreds of customers have used Business Miner and HSBC has publicly shared the advantages of using the tool<sup>5</sup>. It can be used on both case-centric and object-centric data models.

### 4. Future Work

Our future work prioritizes two key aspects: scaling and customization. Scaling the content library is not a trivial task and would usually include manual effort. To overcome this challenge, we are going to integrate generative AI to automatically expand our question catalog, and build a dynamic and up-to-date range of questions. As a result, users can ask any question about their process, which Business Miner will be able to answer by deploying generative AI models on top of the user's data models.

We are going to extend the customization of KPI calculations to allow users access and modify

<sup>1</sup><https://www.celonis.com/solutions/free-plan/>

<sup>2</sup><https://celonis-academy.wistia.com/medias/bjsrbt33fz>

<sup>3</sup><https://docs.celonis.com/en/business-miner-overview.html>

<sup>4</sup><https://academy.celonis.com/courses/introduction-to-business-miner>

<sup>5</sup><http://bit.ly/3Pgi8Wd> starting at 01:02h into the video

the raw PQL calculation to adapt the predefined calculations to the reality of their business. In addition, visualizations of the question-answer threads can be exported to fully customizable dashboards within Celonis development environment Studio [5].

## 5. Conclusion

With its prescribed questions and answers on top of its knowledge pool, Business Miner lowers the entry barrier for process mining. It allows users that do not have a technical background and cannot perform data engineering or analysis on their own a guided way to answer process-related questions.

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