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The Business Case for Process Mining

From Evaluation to Value Realization

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Introduction

Businesses are under constant pressure to change with evolving customer expectations, intensifying competition, and varying regulations. If processes are not optimized regularly, inefficiencies creep in, driving up lead times, pushing up resource consumption, delivering a poor customer experience, and increasing administrative overheads. The COVID-19 pandemic has further exacerbated the need to evolve. Enterprises are racing to adopt digital levers and automation technologies to accelerate transformation and become lean, agile, and resilient.

A major challenge that organizations face when adopting and accelerating digital transformation initiatives is the lack of process visibility and documentation. Manual process discovery and analysis are time-consuming processes that significantly delay the time-to-value realization. These processes also tend to be inefficient and error prone as they rely on opinions, human subjectivity, and biases rather than actual data.

Process mining helps address these challenges by providing an objective and fact-based approach to discover as-is processes and continuously monitor and optimize them. This viewpoint details the role of process mining in ensuring operational excellence and realizing benefits that remain trapped within unoptimized processes. In particular, we examine:

- Understanding process mining
- The drivers for process mining adoption
- Applications of process mining
- High-potential use cases of process mining
- The business case for process mining

This viewpoint will help enterprises create a business case for process mining to drive organization-wide adoption.

Understanding process mining technology

Defining process mining

Process mining refers to any software product or solution that can:

- Collect event log data from different enterprise systems, such as Enterprise Resource Planning (ERP) and Customer Relationship Management (CRM), which contain enterprises' digital footprints and process-related information, such as date, time, user, and activity
- Generate process maps capturing different process variants and the sequence of steps involved
- Extract relevant business insights, such as process discovery, benchmarking, process conformance, process monitoring, and cross-process understanding

Process mining blends the power of data-based analysis techniques, including data mining, sequence mining, clustering, association rules mining, and Machine Learning (ML), to help organizations discover the as-is process and identify process optimization/automation opportunities. The solution adds significant value to traditional process analysis techniques, which rely solely on process owners' knowledge and experience in discovering and understanding processes. It helps build a healthy transformation pipeline via a fact-based approach, with limited reliance on human bias and opinions. It is technology-driven, easier to scale, and provides faster time-to-value. It also provides greater depth and breadth of information, thereby facilitating operational transparency.

Task mining as a complementary capability to process mining

While process mining provides a broad process view, it is unable to provide a micro view into the tasks/activities that users perform. The demand for such a unified view of as-is processes is fueling the need for a comprehensive process mining solution that actively uses task mining as a complementary capability.

Task mining is any software product or solution that can:

- Create UI logs, which comprise user actions and metadata, such as keystrokes, mouse clicks, activity screenshots, and application object IDs that are captured/recorded across desktops
- Generate process maps capturing different process variants and the sequence of tasks/steps involved
- Extract relevant business insights, such as task-level automation opportunities and workforce intelligence

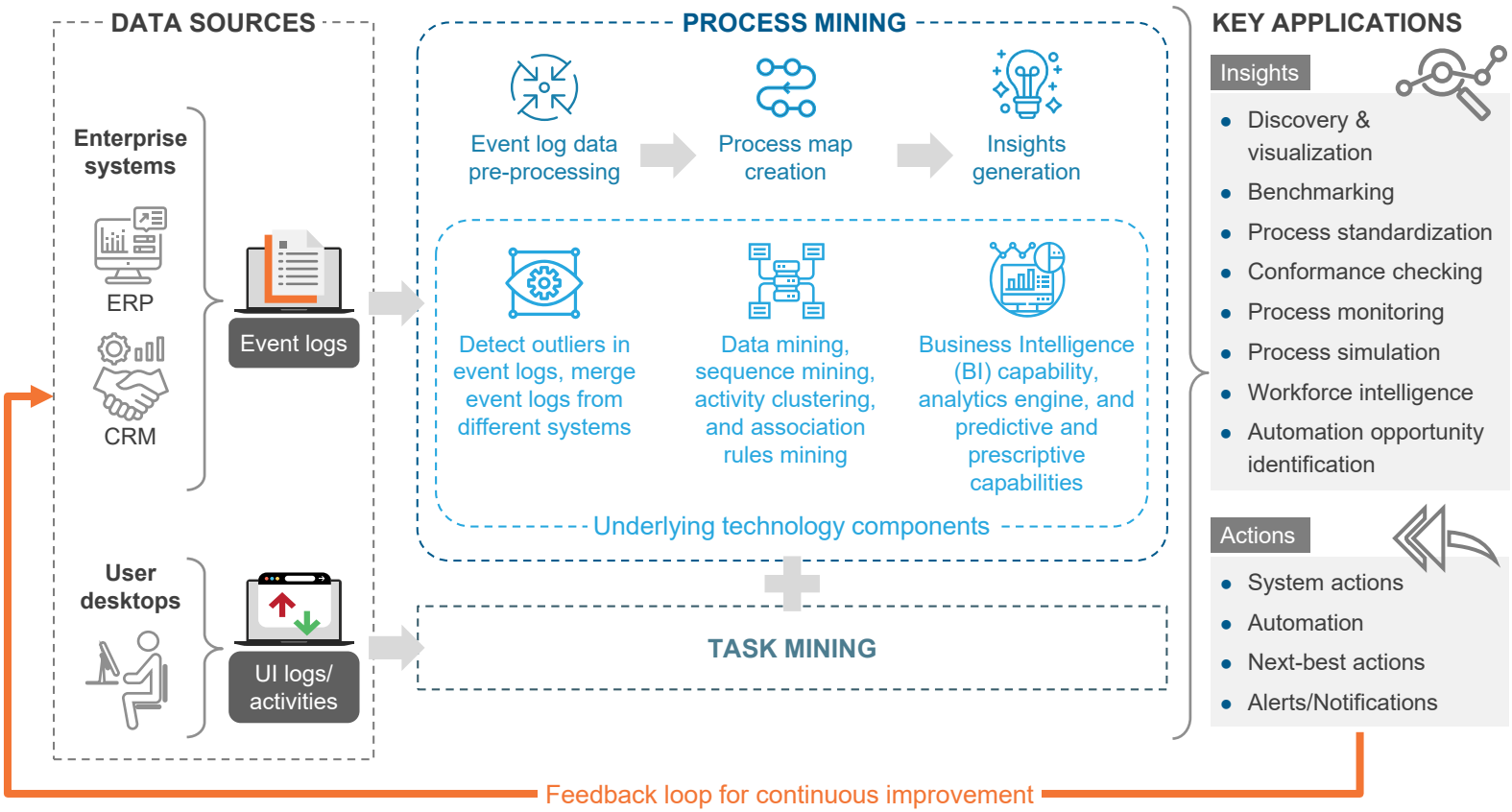
A unified solution that combines process and task mining capabilities weaves together the macro and micro views – or both system-generated event logs and users' desktop activities – for holistic process discovery. It combines multiple data sources and helps address challenges such as data unavailability and limited identification of optimization/improvement opportunities.

The exhibit below illustrates how a process mining solution with task mining capability works in action.

EXHIBIT 1

A holistic process mining solution

Source: Everest Group (2022)



Drivers for process mining adoption

Cost, operational, and strategic impact

Enterprises are fast adopting process mining because of its potential to deliver cost, operational, and strategic benefits, as described below.

Cost impact refers to direct cost savings, improved FTE capacity, and increased number of automated hours.

- **Benefits over manual techniques:** Enterprises can leverage process mining to significantly reduce the effort of the process excellence and business teams involved in manual process discovery
- **Benefits due to optimization:** Process mining offers cost savings as it optimizes/automates processes and efficiently uses resources/FTEs through the insights generated

Operational impact refers to outcomes that go beyond direct cost savings and focus on higher employee productivity, improved operational efficiency and quality, and better governance and compliance.

- **Operations optimization:** Enterprises can leverage process mining to detect anomalies and rework cycles that hinder process and employee efficiencies. They can also monitor and optimize the processes in near real-time by assessing the impact on different KPIs and custom metrics
- **Improved governance and compliance:** Enterprises can leverage process mining for a fact-based and automated approach to conducting compliance checks efficiently
- **Scaling of automation initiatives:** Organizations can identify and prioritize automation processes/tasks by discovering and analyzing factors such as automation potential, frequency, and expected RoI

Strategic impact refers to higher order outcomes related to revenue growth, business continuity, customer satisfaction, employee experience, sustainability, and overall digital transformation.

- **Top-line growth:** Process mining can be leveraged to extract hidden process insights, which can uncover new cross-sell/upsell opportunities or better ways to conduct business, impacting top-line growth
- **Enhanced customer experience:** Enterprises can apply process mining tools to align the discovered customer journey maps with internal process maps to identify customer pain points. This exercise will help eliminate any gaps/deviations in processes, which will improve customer experience
- **Accelerated digital transformation:** Enterprises can leverage process mining to support various stages of digital transformation, such as discovery, creation of a healthy transformation pipeline, and progress monitoring, thereby improving the RoI, time-to-market, and scalability
- **Sustainability:** Enterprises can leverage process mining to gain insights on carbon emissions attributed to process steps and perform continuous monitoring to gauge the impact of the corrective actions they take

The objectives driving process mining adoption vary across enterprises and can range from cost savings to improved governance to top-line growth. Presently, the top drivers for buyers are:

- The need to optimize operations
- Traditional factors such as cost savings, improved governance, and compliance
- The need for automation / digital transformation initiatives, as they help build a healthy transformation pipeline of opportunities, beyond the low-hanging fruits
- Business impact, including the mandate to meet sustainability goals

As enterprises move along the process mining adoption maturity curve, strategic drivers gain higher importance as compared with the traditional drivers focused on cost and operational impact. The journey to becoming a mature process mining adopter involves a mindset change and a focus beyond cost savings and operational efficiencies to enhanced customer/employee experience, higher top-line growth, and newer business models.

The exhibit below shows the importance of various drivers for enterprises.

EXHIBIT 2

Key factors driving process mining adoption

Source: Everest Group (2022)

Importance on a scale of 1 to 7, with 7 being the most important

Dimensions	Overall relevance for enterprises	Subdimensions	Relevance of the driver for enterprises
Cost impact	5.8	Cost savings	5.8
Operational impact	5.7	Optimized operations	6.2
		Improved process governance and compliance	5.8
		Scaling of automation initiatives	5.0
Strategic impact	4.8	Top-line growth	4.5
		Enhanced customer experience	4.9
		Accelerated digital transformation	4.9

Applications of process mining

Process mining has several business applications, including insights such as discovery & process visualization, conformance, process standardization, process monitoring, automation opportunity identification, and workforce intelligence, and execution-level applications, such as triggering of actions/automations for process optimization. We take a closer look at these applications below.

Insights

Discovery & visualization

- Provides in-depth information about as-is processes, generates a process map with different process variants, and enables users to deep dive into each variant
- Gives clarity and objective certainty to enterprises about the areas of a process that are working well and those that are not and helps enterprises discover the variables responsible for process deviations

- Assists enterprises in viewing organization-level relationships, including the delegation of work and clustering of resources

Benchmarking & process standardization

- Helps organizations compare their process performance across teams, departments, business units, and geographies and identify the numerous, scattered ways in which a specific problem is solved across an organization
- Helps identify and define the best practices for standardizing processes to maximize the efficiency, effectiveness, and reliability of operations; this creates order and uniformity in processes across teams and business units
- Assists enterprises in identifying any violations related to defined organizational standards/specifications across teams, units, and geographies

Conformance checking

- Provides insights into deviations/violations in the discovered as-is process map compared with the input reference model or identified ideal variant as part of benchmarking, and segregates conformant and non-conformant cases
- Performs root-cause analysis of the non-conformant cases to identify the causes of process path deviations and highlights the deviations/gaps with the maximum impact on key process KPIs
- Checks for compliance rules such as segregation of duties (e.g., to check if authorization controls for each role were followed) and enables comparison with industry benchmarks to identify and implement best practices

Process monitoring

- Helps monitor/verify process performance against defined or custom metrics/KPIs (throughput times, rework rates, activity occurrences, etc.) using historical information or in near-real time
- Detects bottlenecks in processes and visually highlights shifts in bottlenecks over time on process maps
- Assists enterprises in creating role-specific dashboards for different business roles (e.g., frontline employees, managers, CXOs, and auditors)

Process simulation

- Performs what-if analysis on the discovered process models with multiple scenarios and helps the enterprise visualize the alternative to-be processes; also generates and exports simulated process models of various what-if scenarios in the Business Process Modeling Notation (BPMN) format
- Helps determine the impact and RoI of change initiatives / process redesign
- Assists enterprises in analyzing the dependencies between business processes and identifying potential operational risks

Workforce intelligence

- Generates a graphical view of how work is being performed across teams and applications involved in the process

- Provides workforce-related insights, such as team productivity/performance across tasks and the amount of time each user has spent on different applications to improve resource utilization and re-allocation
- Helps enterprises uncover areas where users violate necessary process execution rules, including the skipping of steps and the order in which tasks and process steps should occur

Automation opportunity identification

- Extracts and leverages process information such as frequency, cost, volume, repetitiveness, and transactional nature to derive the automation potential of process steps
- Determines the potential impact (e.g., cost savings) from automation to help enterprises prioritize the tasks identified to improve value realization from automation
- Exports initial automation workflows to the design studios of automation platforms for further refining

Execution/Action

Action triggers

- **System actions:**
  - Initiates/Triggers workflows based on defined criteria, allowing interactions with multiple third-party applications, connected to process mining using APIs
  - Updates data/records directly in underlying systems such as SAP and CRM without logging into these systems individually
  - Raises service requests in ticketing systems automatically when a user requires support to address a system issue
- **Automation:** triggers automations, including RPA robots, directly from the platform to carry out tasks upon user request or automatically, based on business rules
- **Next-best actions:**
  - Recommends action steps such as assigning a task to a particular user if certain criteria are fulfilled
  - Leverages Artificial Intelligence (AI) / ML models to create prioritized tasks for users to take actions; for example, displaying high-priority invoices to a business manager for approval
- **Alerts/Notifications:** automatically triggers alerts/notifications via email or dashboard displays on KPI breaches, SLA violations, or other events requiring attention

Process mining helps identify and define the best practices for standardizing processes across departments and geographies to maximize the efficiency, effectiveness, and reliability of operations.

High-potential use cases of process mining

Representative use case in the banking industry

Use case: detecting compliance violations and fraudulent behaviors

Problem statement

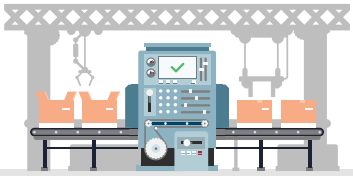
- Banking is among the most regulated industries, comprising a diverse set of processes with distinct and defined guidelines
- It is essential for banks to enforce compliance for each process and proactively detect any suspicious activity, including a high frequency of transactions for an account

Insights

- Process mining can help monitor process execution for any gaps in the process flow and conduct a detailed variant analysis to compare processes across different regions
- It can detect violations in process execution through conformance checks, help identify bottlenecks, and perform root-cause analysis for the gaps/violations

Actions

- Process mining can notify managers in near real-time about any suspicious transaction
- It can trigger automations to update other downstream applications in the event of Service Level Agreement (SLA) violations or fraudulent behaviors
- It can help initiate user training via the next-best-action recommendation for conducting compliance checks



Representative use case in the manufacturing industry

Use case: optimizing production planning

Problem statement

- Enterprises struggle with real-time production planning due to the inability to conduct analysis on integrated data from various sources
- Significant manual effort is required in gathering and analyzing the data, leading to delays in actual production and client delivery

Insights

- Process mining can help address this challenge by analyzing integrated data from enterprise systems (e.g., ERP) and machines (IoT-enabled operational data)
- It can identify resource constraints that lead to bottlenecks and areas of rework that can be automated

Actions

- Based on user-defined rules, process mining can trigger the automations identified on an ongoing basis to help optimize the production process
- It can monitor the process in near real-time and notify relevant stakeholders from the production team about potential delays so that these can be addressed proactively

Representative use case in the healthcare industry

Use case: improving collaboration among departments

Problem statement

- Hospitals consist of several departments that interact with and transfer work to each other in the course of a patient's treatment
- Suboptimal resource allocation and inter-departmental delays often lead to a poor patient experience

Insights

- Process mining can leverage data from Healthcare Information Systems (HIS) to generate a workflow view of the different patient care paths in a hospital
- It can help determine organization-level relationships by identifying clusters of interdependent departments, thereby improving resource allocation and reducing friction in the process

Actions

Process mining can trigger RPA robots or API-based automation to update various systems of record with patients' treatment statuses. This automation helps avoid the human effort required for transactional data entry and prevents data mismatch across systems.

Representative use case in the CPG & retail industry

Use case: improving online customer experience

Problem statement

- Customers switch from one e-commerce company to another when they do not have a satisfactory experience during a purchase
- Understanding customer pain points is vital to improving the overall experience and ensuring the conversion of leads into sales

Insights

- Preprocessing of weblog data to be used as event logs, followed by its analysis through process mining, can help track customers' navigation flows across the website
- Process mining can help identify bottlenecks / areas of improvement in cases where customer interaction ends without a purchase

Actions

Process mining can notify relevant stakeholders about the possibility of premature closure of customer navigation so that near real-time actions, such as proactive chat support, can help prevent it.

As the above use cases demonstrate, process mining can help analyze processes, generate insights, and identify improvement opportunities. The processes can be industry-specific or industry-agnostic/horizontal. As long as organizations use enterprise systems to conduct processes, process mining can be applied to mine the process data stored as event logs. For example, in the banking industry value chain, process mining can be applied across industry-specific processes (such as credit evaluation & verification, account maintenance, underwriting, and remittance & clearing) and industry-agnostic processes (such as IT service management, hire-to-retire, and accounts payable). In the next section, we consider Finance & Accounting (F&A), an industry-agnostic business process that accounts for a majority of global process mining deployments and growth to develop a quantitative business case for process mining.

Developing a business case for process mining

Developing a quantitative business case for process mining

An enterprise's process optimization initiative can be broken down into three major steps:

- Discovering/Visualizing as-is processes
- Identifying process improvement opportunities
- Executing/Implementing improvement opportunities to maximize RoI

Traditionally, enterprises have used manual techniques, with little or no use of software, for these three steps. Such manual techniques require significant time, effort, and cost to bear meaningful results.

In this section, we illustrate the business case for process mining across the three process optimization stages in the Accounts Payable (AP) process in F&A.

Step 1: discovering/visualizing as-is processes

The discovery stage's primary objective is to capture as-is processes and verify any existing process understanding/hypothesis. Process discovery starts with the collection of process-related information/data from various stakeholders and data sources. Enterprises face many challenges because of the use of manual discovery techniques, such as interviews and workshops, which rely on the availability and knowledge of key business stakeholders and process owners. A manual approach also fails to generate the true picture because of stakeholder biases and consumes significant time, effort, and costs.

Process mining plays a significant role in addressing these challenges, thereby establishing the business case for adoption. It uses a data-/fact-based approach instead of relying on anecdotes, helps visualize the current state of process flows, and validates known process-flow information. It significantly reduces the discovery time, effort, and costs versus traditional manual techniques. The knowledge of business processes gained through the discovered process maps forms the basis for identifying process improvement opportunities.

Step 2: identifying process improvement opportunities

We explain this through an example of a US-based manufacturing enterprise with operations worldwide.

- The enterprise generates US$10 billion in annual revenue, of which it spends about 70% on procurement
- Cost of Goods Sold (COGS) and Selling, General, and Administrative (SG&A) expenses as percentages of revenue are 60% and 20%, respectively
- It employs 140-160 FTEs in the AP process and processes about 1.1 million invoices a year
- It has an in-house team of operational excellence resources (green/black belts) for process optimization

Assumed cost components

- Blended hourly rates of operational excellence resources, operational SMEs, and data engineers are US$90-95, US$45-50, and US$55-60, respectively
- The average cost of processing a supplier invoice, from reception through payment, is US$4
- The process mining software license is based on a commercial model, a hybrid of user and event log volume-based pricing models, which is offered as a package based on the number of concurrent users and the volume of event logs ingested to discover processes (software costs and commercial models vary across providers)
- Service providers or process mining technology providers carry out professional services for software implementation, and these are typically charged based on time and materials
- The enterprise's cost of capital is 7%

Scope

- Monitoring the discovered processes to identify and quantify improvement opportunities
- We considered three business objectives (along with their metrics and corresponding improvement opportunities) that fall within the purview of AP and can yield savings/benefits:

Business objective	Spend control	Labor productivity	Working capital optimization
Key metric	Excess spend	Automatic match rate	Days Payable Outstanding (DPO)
Scenario	Enterprises lose approximately 0.1% of the overall procurement spend in a year due to duplicate invoice payments.	Typically, 15-25% of the invoices fail the three-way match process in most organizations.	Enterprises with unoptimized/low DPO pay their invoices early and are forced to obtain a working capital loan.
Improvement opportunity	Process mining can identify duplicate invoices and prevent payouts, thereby arresting excess spend.	Process mining can prevent or resolve three-way match errors and reduce/eliminate rework.	Process mining can adjust payment runs and ensure payment terms consistency, thereby increasing DPO (assumed to be 1 day for this business case) and optimizing working capital requirement.

Approach

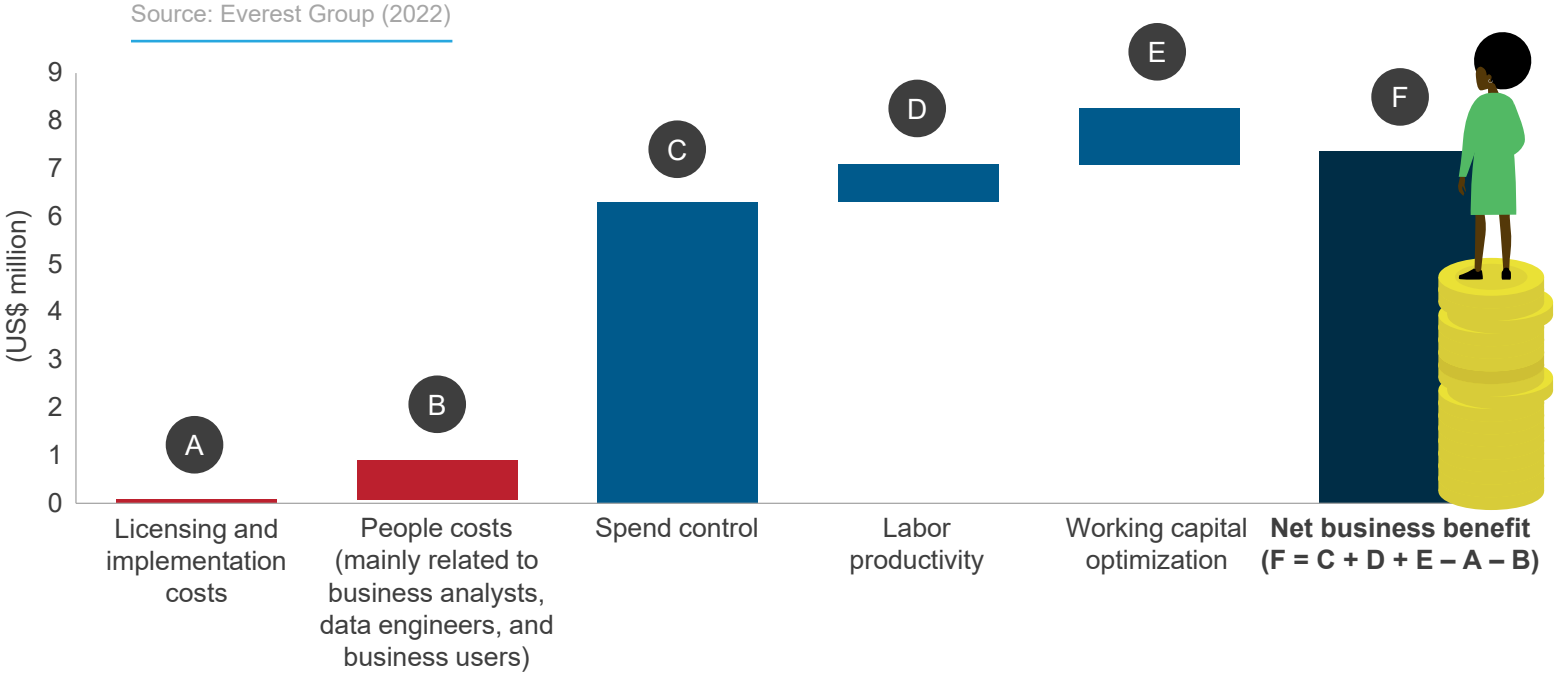
- Estimating the gross potential benefits/savings from the opportunities that process mining identifies
- Evaluating the net benefit after deducting associated license, implementation, and people costs from gross benefits

The following exhibit illustrates the calculated net benefit from the improvement opportunities that process mining identifies.

EXHIBIT 3

Net benefit identified using process mining

Source: Everest Group (2022)



Outcomes

- The number and type of process improvement opportunities could vary for enterprises
- In the context considered, identified improvement opportunities have generated gross benefits worth 9X the total cost. The enterprise has the potential to realize a maximum net benefit of about **US$7 million**, provided that it efficiently acts on the process mining-generated insights

Step 3: executing/implementing the improvement opportunities

Process mining empowers strategic decision-making by providing data-based insights through non-biased analysis. At the same time, it can identify and present process improvement opportunities. Enterprises should act on process mining insights to realize value from these opportunities. For example, when an ML-powered process mining solution (without built-in execution/action capability) identifies and presents invoices that will be overdue to a manager, he/she needs to share the invoice details with subordinates via email and then assign tasks to them, including flagging/updating appropriate enterprise systems about the potentially overdue

invoices. Based on the manual actions, the enterprise can prevent paying penalties and realize savings on the potentially overdue invoices.

A process mining solution augmented with execution capabilities can help eliminate/streamline such manual intervention and better enable enterprises to convert insights into actions. These capabilities allow enterprises to interface with downstream applications and complementary technologies, such as RPA, directly from the product for a holistic process optimization experience. Additional capabilities include the ability to create workflows, which enterprises can trigger based on predefined rules, acting on the process mining-generated insights.

While the identified improvement opportunities can yield significant benefits, the extent to which enterprises can realize value depends on the level and speed at which they employ the execution levers. Below we illustrate how process mining, along with out-of-the-box execution/action capabilities, enables enterprises to meet the business objectives and maximize benefits.

Business objective: spend control

- **Insight/approach:** Process mining can leverage AI/ML algorithms to identify duplicate invoices, thereby preventing accidental payouts and duplicate invoice payments
- **Applicable execution levers:**
  - **Alerts/Notifications:** Process mining can inform relevant users about the identified invoices via mail or dashboard notifications
  - **System actions:** It can automatically update underlying systems, such as SAP, and prevent duplicate invoices from being paid

Business objective: labor productivity

- **Insight/approach:** Process mining can prevent employee rework and increase the three-way matching process' efficiency
- **Applicable execution levers:**
  - **Automation:** Process mining can automate the entire three-way matching process, that is, use Application Programming Interfaces (APIs) or RPA to retrieve Purchase Orders (POs) and goods receipts, and perform checks
  - **System actions:** If the three values match with each other, appropriate systems are (automatically) informed that the invoice has passed the check. In case of an exception, the solution can identify the root cause (unavailable PO, etc.) and update underlying systems

Business objective: working capital optimization

- **Insight/approach:** Process mining can analyze and identify problematic patterns in payment terms and payment runs for supplier invoices
- **Applicable execution levers:**
  - **Next-best actions:** Sometimes, suppliers send invoices that have different payment terms than those defined in enterprise systems. Process mining can identify such invoices and present them to a manager to initiate a conversation with the relevant suppliers. It can also provide the option of temporarily blocking payment by updating the underlying enterprise system

- **System actions:** Many enterprises have pre-defined days on which payment disbursement batches are run, which might not be aligned with invoices' payment terms. Process mining can analyze such mismatches and inform the enterprise system to prevent early payment
- **Alerts/Notifications:** The solution can send alerts/notifications to business users whenever it identifies a problematic pattern related to invoice payment

Conclusion

Process mining provides a data-based approach to achieving operational excellence through numerous applications. Its uses span industries and process areas, as it enables enterprises to unearth the hidden potential in their processes. It identifies improvement opportunities and also provides execution/action capabilities to realize value. In essence, process mining plays an essential part in uncovering and replenishing a company's process DNA.

Enterprises can embark on their process mining journeys by creating and executing quick-win business cases and identify more complex use cases as they mature in their journeys. However, irrespective of their maturity levels, enterprises need to follow an iterative approach to creating business cases and revisiting them to maximize the benefits. Processes must be re-monitored to extract greater value and optimized further. As enterprises look to build future-proof operations, investing in iterative or continuous improvements will be critical to achieving sustainable business advantage. Process mining will equip enterprises with the ability to run continuous improvements on their own.

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With you on the journey

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