Create Data-Based Process Excellence and Continuous Process Improvement
Enabling Agile, Efficient Digital Business Processes with an Operational Intelligence Platform
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Cross-functional, digital, end-to-end processes often span multiple business systems and technologies. But few companies can measure process performance in real time, allow business users to act on insights gained from performance measurements, or use performance assessments to identify weaknesses, deviations, and optimization opportunities. An operational intelligence platform can help – acting as both a “fitness tracker” that monitors ongoing processes and an “MRI” that helps companies take action on performance issues.
Digital Processes as a Catalyst for Improved Efficiency and Agility

ESTABLISHING THE FOUNDATION FOR DIGITALIZATION

Digital processes are at the heart of every business. Until recently, it was common for core systems such as CRM, ERP, supply chain management, and human capital management to run isolated processes. More often than not, the processes were optimized for cost-effectiveness only within specific business silos in the organization.

As companies pursue digital transformation, however, siloed processes are no longer competitive. Increasingly, leading enterprises are implementing digital, cross-application processes that address multiple core business systems and generate large volumes of data at high velocity. The processes typically involve several participants from multiple business departments or even different organizations.

Organizations are also incorporating a variety of rapidly evolving technologies, such as Big Data, the cloud, analytics, and mobile. Accordingly, they are looking at the opportunities afforded by emerging new technologies such as machine learning, Blockchain, and Internet of Things sensors and devices.

To keep pace with this changing technology landscape, many digital leaders are moving forward with bimodal IT models. These models typically include a system of record that provides stable, secure, high-performance services and a system of innovations that delivers innovative, technology-intensive services quickly.

The shift to bimodal IT models has resulted in a rapid increase in cross-functional integration among various systems of record and systems of innovation. This integration is enabling digital processes that help enterprises:

- **Automate, optimize, and simplify processes** – accelerating operations, minimizing operational costs, and enhancing business value
- **Monitor ongoing processes for situational awareness in daily operations** – turning insight into instant action and enhancing agility
- **Analyze as-is processes based on transactional data** – helping users discover variants and deviations for improved efficiency

Comprehensive process integration lets enterprises cut across business silos so they can digitally connect people, things, business functions, and organizations. Integration supports the creation of agile, adaptive processes that enable rapid response to new daily operational situations and changing business needs. It facilitates the use of technological innovations to enable differentiating processes that enhance business value and efficiency. At the same time, end-to-end integration accelerates the use of these technological innovations, simplifying processes for end users and creating the foundation for digital organizations.
Benefits of an Operational Intelligence Platform

CREATING A HOLISTIC VIEW OF PROCESS PERFORMANCE

Typically, business systems, applications, and technologies perform continuous monitoring of certain activities. The data collected from these activities helps the IT team understand systems and infrastructure performance.

It seems surprising, then, that users – such as process owners, line-of-business professionals, end users, and business administrators – lack complete visibility into organizational processes and operations from a business perspective. Instead, they must “make do” with a narrow view of the performance of each process step within each system.

Fortunately, the increasing digitalization of business processes creates an opportunity for increased visibility at an operational level. Companies can deploy an operational intelligence platform that uses a modern, in-memory data platform to process and analyze Big Data in real time while drawing insights from both ongoing transactions and complex data sets. With this platform, organizations can give their business users, process owners, and business analysts a holistic view into the overall performance of an entire process flow – even one that involves multiple systems.

An operational intelligence platform provides a holistic view into the overall performance of an entire process flow.
**DEFINING PLATFORM COMPONENTS**

An operational intelligence platform is a collection of software tools that gathers information from heterogeneous business sources and synthesizes it into a complete view of all process-related data across all systems. Components of an operational intelligence platform can vary, but they typically include:

- **Adapters** – Provide access to a variety of data types and sources, including systems of record and systems of innovation
- **Event processors** – Filter incoming data and analyze it in real time to detect patterns, relationships, and correlations that can indicate threats or opportunities
- **Predictive analytics, scoring, and machine learning** – Compute KPIs and help users keep tabs on the performance of every step or milestone in a process
- **Big Data analytics** – Analyze and visualize huge volumes of data generated by processes, helping discover how processes were executed
- **Process visualization** – Graphically represent how processes and their variants were executed
- **Dashboards** – Present real-time, continuously updated data that helps users visualize KPIs and other insights through charts, maps, and tables
- **Notification features** – Send alerts or messages using e-mail, text messages, or SMS
- **Rule processors** – Automate responses to specific conditions
- **Response systems** – Support resolution processes that can include human behavior, such as creating tasks or taking direct action, and trigger automated responses based on predefined rules from within various process phases

**DATA SOURCES FOR OPERATIONAL INTELLIGENCE PLATFORMS**

- Sensors
- Transactions
- Applications
- Databases
- Social media and sentiment analysis
- Business partners
- Mobile data
- Business information
DELIBERING VALUE TO BUSINESS USERS

Business executives may wonder why they need a new platform to understand operations. After all, many companies have business intelligence and analytical applications. However, traditional solutions provide a periodic view into the past. They measure whether process steps were executed as expected, after the fact.

In contrast, operational intelligence platforms can help business users determine what is happening in the moment. With that knowledge, users can decide on the next best steps and take immediate action to ensure each process is on track. Process owners and business analysts can also assess process variants and optimization opportunities by using data-based process discovery to gain full transparency into actual process execution.

By providing a holistic, extensive view into the overall performance of processes and operations from a business perspective, operational intelligence platforms help organizations ensure that processes operate at their best. The two main benefits are:

• **Improved agility** – Business users gain up-to-the-moment situational awareness of how processes are performing across multiple systems and departments. Users can turn that insight into instant action, helping them respond quickly to new situations in daily operations and improve operational excellence.

• **Increased efficiency** – Process owners and business analysts gain transparency into as-is processes. Using data-based process discovery, they can identify process variants, compliance deviations, weaknesses, and inefficiencies and pinpoint opportunities for continuous process improvement.

WHO USES AN OPERATIONAL INTELLIGENCE PLATFORM?

**Business users:**
- Line-of-business professionals
- Business process participants (such as end users)
- Process operators

**Process owners:**
- Line-of-business heads
- Business process experts
HOW IS AN OPERATIONAL INTELLIGENCE PLATFORM DIFFERENT FROM IT MONITORING?

<table>
<thead>
<tr>
<th></th>
<th>Operational Intelligence Platform</th>
<th>IT Monitoring Solution</th>
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<tbody>
<tr>
<td><strong>Purpose</strong></td>
<td>Provide line-of-business professionals and process operators with up-to-the-minute monitoring of processes spanning multiple systems and the ability to take immediate corrective action. Help business process owners and business analysts visualize and assess operative processes to detect deviations or bottlenecks.</td>
<td>Provide IT department and operations managers with alerts on preconfigured KPIs across workflows and transactions such as interface failures, backlogs, and delays from a system perspective.</td>
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<tr>
<td><strong>Approach</strong></td>
<td>Confirmative (process monitoring) and explorative (process analysis)</td>
<td>Confirmative (monitoring and diagnostics)</td>
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</table>
| **Functionality**    | • Monitoring of process phases, milestones, and KPIs  
• Data-based discovery, visualization, and assessment of as-is processes | • Monitor technical interfaces  
• Check data consistency and execution of background logs  
• Support and safeguard system deployments |
| **Analytics scope**  | Monitoring and analysis of processes from a business perspective | Management and optimization of associated IT landscapes |
| **Users**            | • Business users  
• Process owners | • IT department  
• Operations managers |
Real-Time Visibility into Ongoing Processes

IMPROVING BUSINESS AGILITY WITH PROCESS EXCELLENCE
An operational intelligence platform provides business users with a holistic, end-to-end view of the overall performance of processes and business operations. The platform allows users to use this insight to take direct action. It can also trigger rule-based automated responses.

Using an operational intelligence platform to support digital processes is like having a fitness tracker for ongoing processes and business operations. The platform provides business users with better situational awareness in daily operations, which helps them ensure that business processes are running optimally.

The platform combines up-to-the-moment process monitoring with pattern detection, analytics, alerting, drill-down features, and response management. Business users can both detect and respond to emerging situations, quickly and effectively. The insight enabled by the platform helps enterprises:

- **Gain agility** by responding in real time to process events, business disruptions such as rating errors, and technical disruptions such as interface issues. Users can realize insights into process performance, accelerating optimization and redesign efforts.
- **Control operational costs** by identifying and remediating potential bottlenecks or compliance issues before they affect customers, cause unnecessary cost, or impact service-level agreements (SLAs).
- **Improve process governance** by tracking process performance against targets, supporting optimal process execution and improved prediction of cycle times.

With these advantages, organizations can improve response times, accuracy, and operational effectiveness while achieving data-based operational excellence.

Using an operational intelligence platform is like having a fitness tracker for ongoing processes and business operations.
Because of the different applications and technologies involved in billing, however, monitoring of the billing process is commonly done on a component level. End-to-end cross-component monitoring and visibility is rare. As a result, companies experience a lack of transparency and insight into billing processes, which can create suboptimal process execution, missed opportunities, delays, and customer dissatisfaction.

**EXAMPLE: REDESIGNING BILLING PROCESSES**

As companies replace traditional “sell, ship, and collect” business models with services that rely on subscription- or usage-based billing, they often need to develop new billing processes. To monetize these new business models, enterprises need fast, flexible billing processes and automated revenue management tools that support high-volume billing. These processes must span applications, work across various technologies, and be highly optimized for maximum throughput.

Operational intelligence platforms help organizations ensure that **processes operate at their best**.
Cross-Component KPI Tracking from a Central Cockpit

SAP® Operational Process Intelligence software helps billing operations teams gain real-time visibility and control into the full consume-to-cash process using cross-component KPI tracking. From a single cockpit, users can view aggregated and line-item-level KPIs. The software tracks events from acquisition through rating, billing, payment, and collections across SAP and third-party applications. See Figure 1.

**Figure 1: Real-Time Process Visibility for Data-Based Operational Excellence**
Benefits of SAP Operational Process Intelligence include:

- **Optimized operational decision-making** – Gain immediate insight to action, and make related corrections using detailed, instance-level monitoring
- **Improved revenues** – Learn whether all imported events have been billed, and calculate the value of unbilled revenues
- **Enhanced transparency into billing errors** – Monitor the number of rating failures, billing upload failures, billing excerpts, and invoicing out-sorts in the currency or metrics of one’s choice
- **Increased insight into cycle times and SLAs** – Measure the time needed to execute billing processes, and learn how much time is spent correcting erroneous data

By enabling real-time, in-flight process visibility and actionable insights, SAP Operational Process Intelligence helps enhance business outcomes by improving time to resolution and reducing cycle times.

Business users need **full visibility into organizational processes and operations** from a business perspective.
INCREASING EFFICIENCY WITH CONTINUOUS PROCESS IMPROVEMENT

Fully digitalized processes leave digital footprints in the systems they touch. That’s why an operational intelligence platform built on top of digital processes can serve as an MRI that reconstructs and visualizes the digital footprints left by each process step. The platform enables data-based process discovery, allowing process owners and business analysts to analyze how as-is processes are actually being executed, how they are performing, and where they require improvement.

By extracting the digital footprints of each process step from the underlying systems, the platform can create a model of the process as it was actually executed. This process model abstracts the behavior of all process variants that occur as the business process is being executed by multiple actors. The output is an intuitive graphical representation of the underlying process model and all its variants, exactly as they were executed. Process owners and business analysts can use the visualization and drill-down features to analyze processes, identify process variants and compliance deviations, analyze root causes, and pinpoint weaknesses and inefficiencies.

The platform helps enterprises gain full transparency into as-is processes, based on transactional data from business systems. This insight helps decision-makers better identify opportunities for process improvement that support:

- **Efficiency**, such as bottlenecks or increased cycle times that negatively affect service-level agreements or operational costs
- **Compliance**, by highlighting noncompliant processes or fraud that can have legal implications
- **Conformance**, where deviations from the defined model bloate the process or require manual rework

Using process mining techniques, organizations can realize complete transparency into their as-is processes. With that insight, they can assess process optimization opportunities for data-based continuous process improvement.

An operational intelligence platform can serve as an MRI that **reconstructs and visualizes the digital footprints** left by each process step.
EXAMPLE: REMEDIATING COMPLEX PURCHASE-TO-PAY PROCESSES

Many companies struggle to identify weaknesses and inefficiencies in high-volume, highly complex processes such as purchase to pay, order to cash, accounts payable, and material flow. Because these processes involve a high number of transactions and require multiple approvals, procedures, and interaction with internal and external contacts, it can be difficult to identify inefficient or noncompliant steps. Performing a root-cause analysis and determining how best to rework these processes is also challenging.

Traditional business intelligence and analytical applications provide only a periodic snapshot of the past, allowing users to determine whether process steps executed as expected or whether deviation occurred. These tools lack enhanced features, such as pattern detection, which would help to identify the cause of any deviation by allowing users to capture and analyze processes as they are actually executed. Some companies attempt to resolve process weaknesses by interviewing process participants and creating qualitative reports—an approach that is both expensive and time-consuming. Yet the lack of quantitative input limits the accuracy and repeatability of results.

Data-Based Process Discovery and Analysis

SAP Process Mining software by Celonis uses data-based process discovery to detect process variants, analyze root causes, and identify opportunities for process improvement (see Figure 2).

Purchase-to-pay processes, for example, typically include a multitude of process steps that cover activities such as requests, purchases, receipts, payments, and accounting for goods and services. Using data-based process discovery and analysis, process owners and business analysts can visualize and explore actual processes and deviations from the to-be process.

SAP Process Mining enables companies to:
• Identify rework activities that require manual effort and slow process execution
• Analyze throughput times to spot unnecessary complexities, bottlenecks, and holdups
• Spot prime candidates for automation
• Assess the monetary impact of purchases with discount losses
• Pinpoint maverick behavior, such as buying without involving the purchasing department
• Identify and standardize on best-practice processes across business units or organizations
• Validate process improvements by comparing process performance before and after modifications

With SAP Process Mining, enterprises can gain full transparency into processes—leading to efficiency gains and cost savings.
Using **data-based process discovery**, process owners and business analysts can detect process variants, analyze root causes, and identify opportunities for process improvement.
Data-Based Process Excellence

IMPROVING THE PROCESS MANAGEMENT LIFECYCLE
Understanding the value of data-based process excellence requires a detailed review of the business process management (BPM) lifecycle. We also can compare the current capabilities of leading organizations with the best practices they can achieve.

One of the criticisms of traditional BPM technologies is that they are not flexible or agile enough to adapt to changing circumstances. The two key contributors to this problem include the need to manage:
• Large numbers of process path variants typical of most real-world environments
• Expected process exceptions

Comprehensive Business Process Management
SAP offers solutions that can help enterprises address today’s critical BPM lifecycle challenges. We offer an intelligent business operations bundle that includes all of the functionality needed to implement a comprehensive BPM system. The bundle includes SAP Process Orchestration technology, SAP Operational Process Intelligence, SAP PowerDesigner® software, and SAP HANA® streaming analytics software. Complementary to the bundle is SAP Process Mining.

Together, these solutions help companies manage business processes from enterprise architecture design and documentation to implementation, integration, execution, and monitoring of business process models – from the simplest to the most complex processes (see Figure 3).
Figure 3: Optimized Processes Throughout the Business Process Management Lifecycle

SAP® Process Orchestration
Model, execute, and monitor custom process applications. From simple workflows to complex processes, the technology enables enterprises to develop innovative process applications that can span solutions from SAP and other vendors.

SAP PowerDesigner®
Business and IT specialists create and adapt processes jointly using the graphical business process model and notation (BPMN) standard. The resulting models serve as a source for enterprise architecture, business processes, and data architecture.

SAP Operational Process Intelligence
This “fitness tracker” provides business users with end-to-end, real-time visibility into ongoing processes and business operations. It enables situational awareness in daily operations and the ability to turn that insight into instant action.

SAP Process Mining
This is the “MRI” that reconstructs and visualizes the operative processes running within your SAP solutions and third-party applications. It enables data-based process discovery, allowing process owners and business analysts to analyze how as-is processes are actually being executed, how they are performing, and where they require improvement.

Insight to (re)design
Insight to action

Design and redesign
Implementation
Monitoring
Adjustment
Diagnosis versus requirements
Models
Data

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Design and Redesign
Enterprises need to not only design new business processes but also redesign or document existing processes. Rather than shadowing key stakeholders in the business processes, which can be an expensive and time-consuming activity, SAP Process Mining can be used to document processes. The software uses process event log files to reconstruct the different paths followed during business process execution. By understanding which process variants are encountered during execution, process experts can build them into the process design or manage them as exceptions.

Business process documentation and change management can also create issues during process design or redesign. Sourcing business processes from an existing repository, such as the business process repository in SAP Solution Manager or the SAP Best Practices Explorer tool, supports the creation of a foundation for best-practice business process design. All SAP solutions use the Business Process Modeling and Notation (BPMN) 2.0 language to document business processes.

Our software can import and extend or modify best-practice process models using SAP PowerDesigner. This software can import standard business process models in SAP Best Practices packages and the business process models created using SAP Process Mining. By importing these models into SAP PowerDesigner, enterprise architects can perform initial business process design and use the models as the source for enterprise architecture, business processes, and data architecture.

Implementation
BPM tooling is included in SAP Process Orchestration technology, which includes a design studio that can be used to enrich the business process models managed in SAP PowerDesigner. The business process then can run using automatically generated code.

With the process orchestration software, multiple user interfaces allow interaction with people in human-centric BPM activities. It also includes an enterprise service bus that allows reuse of services. As representational state transfer (REST)–based API services become more popular, SAP software can also be used within workflows.

SAP offers solutions that can help organizations address today’s critical business process management lifecycle challenges.
Monitoring and Adjustment

Where conventional BPM systems are restricted to managing process exceptions through their confined business process models, our software supports a more responsive approach. SAP Operational Process Intelligence uses KPIs, milestones, activities, and rules to detect and handle exceptions – either manually through personalized dashboards or using automatically invoked activities triggered by KPI-specific rules.

For manual exception handling, operational managers monitor process performance against KPIs on a management dashboard. If managers notice, for example, that the number of processed packages is falling below the established SLA, they can review the specific packages that are taking too long to process and use the process event data to help identify a cause. Managers can also use the internal messaging system to communicate with their team and resolve issues.

Automatic exception handling uses automated rules to identify when SLAs are at risk and to initiate a predefined action. For example, the software can send e-mails to operational managers, reallocate activities, or automatically transfer funds, depending on the business process involved.

The software also includes an adjustment feature that helps line-of-business professionals or process operators fine-tune business processes and optimize performance. In addition, a technical monitoring feature helps to ensure the system is running correctly and that messages and services are being processed in a timely way.

SAP offers an intelligent business operations bundle that includes all of the functionality needed to implement a complete BPM system.
Diagnosis Versus Requirements
Traditionally, organizations have used highly manual methods – such as job shadowing, interviews, and workshops – to gauge the effectiveness of business processes and assess potential performance improvements. However, these measurement methods are subjective, deliver only high-level insights, and are prone to unreliable results based on human behavior. Tooling in this area has previously worked at the macro level, providing insights into overall business process performance against KPIs but unable to perform fine-grained analysis of underlying causes.

SAP Process Mining, using the power of the SAP HANA platform, analyzes process event data from all sources involved in a business process, including SAP and third-party sources. The software presents graphical, analytical views of the end-to-end process. Rather than analyzing process performance against preconceived business models, it delivers true insights – and sometimes unexpected results. For example, the software can help managers understand why shipments from certain suppliers are regularly late or why returns are higher from certain stores than others.

Using these insights, managers can adjust business processes. They can also modify the rules that guide SAP Operational Process Intelligence during monitoring and adjustment phases to optimize performance. And businesses can apply their learnings to the redesign of existing processes.

LEARN MORE
In the digital economy, cross-functional integration and digital processes spanning multiple business systems and various technologies are critical for the success of any organization. Automation, monitoring, and analysis of processes enable reduced complexity and streamlined, data-driven operations.

An operational intelligence platform can help organizations to keep tabs on their processes by serving as both a fitness tracker for monitoring ongoing processes as well as an MRI for identifying process optimization opportunities.

To learn more about how SAP software for application integration and infrastructure can help you lay the foundation for becoming a digital organization, visit us online.