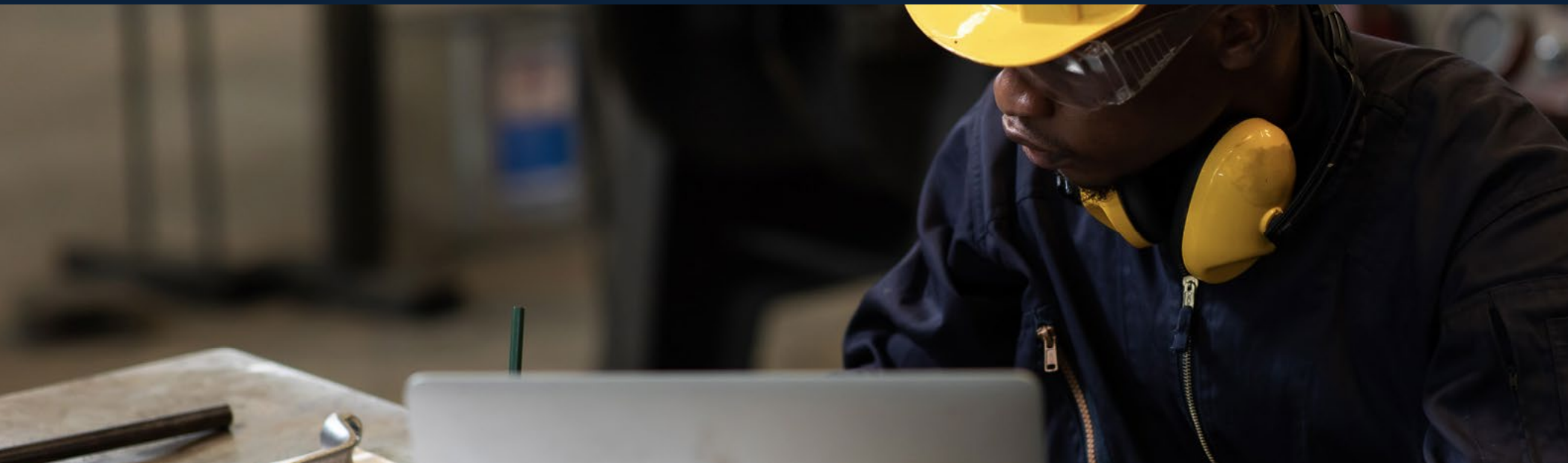




UNDERSTANDING PROCESS INTELLIGENCE

AND ITS IMPACT ON THE MANAGEMENT
OF BUSINESS PROCESSES



The Broad Context of Process Intelligence

In this digital era, it's evident that **great leaders excel at leveraging data to create value**. The stark difference in how much revenue each employee generates at digital companies compared to traditional businesses proves this point. To close this gap, companies need to constantly integrate data, making it accessible to management and operations and crucially, turning it into actionable insights.

Process Intelligence serves as a crucial tool for understanding and optimizing the processes that drive business goals. While it has technical elements, it is at the heart of business transformation, making it a strategic priority for leadership.





Understanding Process Intelligence

What is Process Intelligence?

Process Intelligence uses technology to analyze business processes by examining transactional events—like order placements and payment confirmations—captured in business applications¹. This method transforms how processes are monitored and improved and with implementation, manufacturers can typically enjoy a 15% to 30% reduction in targeted process production times. These improvements deliver immediate financial benefits by eliminating operational inefficiencies and reducing penalties and late fees.

Starting around 2011, a significant change occurred: instead of looking at a perfect diagram on how processes should look, companies are now using real data from their systems to see how processes actually work.

Process Intelligence flips how we manage processes. Suddenly, manufacturers can see their entire business operations as they happen, along with all the different ways things are really done.

This gives them a level of clarity they never had before. They can see

the stark difference between how a process was designed and how it's truly running. This helps them achieve two key goals: making their operations more efficient and giving customers a better experience

Process Intelligence has revolutionized process management, providing instant access to global operations and diverse real-world scenarios.

¹By 'business application', we mean the software used by company departments to record the various steps involved in managing daily operations. Examples of typical business applications include ERP and CRM systems, as well as ticket management tools.

Who is Process Intelligence for?

Process Intelligence can benefit any organization, its impact on manufacturers is transformative, with end-to-end visibility across their supply chain and operations enabling them to optimize operations, reduce costs and increase output.

As a tool, Process Intelligence serves three main functions within an organization:



Empowers managers:

By providing unmatched clarity, it gives managers immediate insight into the complexities of critical processes, empowering them to make informed daily decisions with unmatched responsiveness.



Operational assistance for Operators:

By making suggestions based on the general type of optimization being sought, operators can easily prioritize tasks such as avoiding late payments or the triggering of needless call-outs.



IT's Ally:

When automating large numbers of tasks according to their importance, it can help IT manage ticket tracking or supervision of the replacement of a core application, such as an ERP or CRM system.

In general, Process Intelligence is a unifying force beneficial to a user community. It provides a platform for discussion and consensus-building, grounded in factual data and insights, leading to better decision-making and outcomes.

Understanding the Synergy Between Business Process Management and Process Intelligence

Process Design and Process Intelligence are two pivotal elements in effective Business Process Management.

While Process Design focuses on creating optimal workflows and structures, Process Intelligence leverages data analytics to monitor, analyze and enhance these processes in real-time. Together, they form a complementary relationship that drives operational excellence and continuous improvement in business operations. While the former determines a well-structured process from the outset, the latter aims to continually optimize through data-driven insights.



Process Intelligence and Digital Records

The internet boom of the early 2000s spurred a rapid digitization of services. This shift to online services has led to storing transactions in system log files, allowing businesses to detect and analyze process steps from vast amounts of raw data.

Initially, digital record-keeping was seen as a means of safekeeping information. However, the stored data has since become the foundation for significantly more effective process management and improvement.

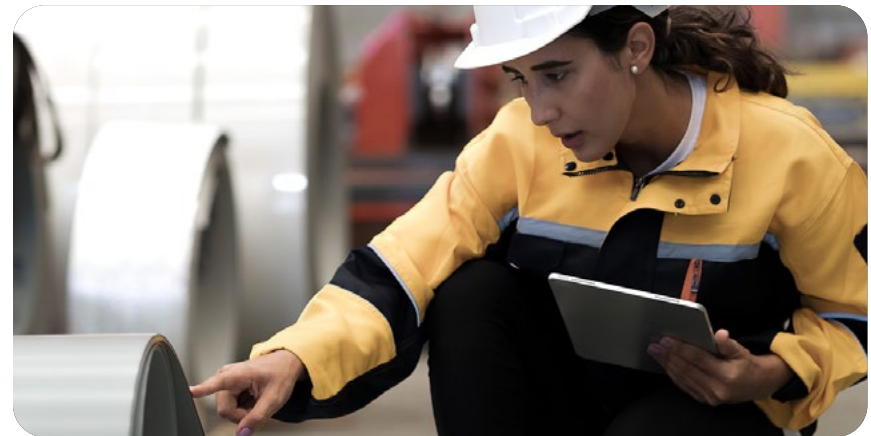
With the advent of Process Intelligence, it is now possible to analyze the “history” of a process without expert assistance like detecting bottlenecks, the identification of redundant operations and the discovery of process variants. Consequently, discussions about process management have become more data-driven, challenging the traditional reliance on expert opinion.

Now, historical logs can be uploaded immediately, allowing for prompt improvements without the need for a lengthy data collection period.

Process Intelligence and Real-time Analysis

Daily operations involve workers and machines executing defined processes. Concurrently, systems capture detailed event logs, effectively creating a ‘digital twin’ that reflects the physical workflow. This integration of physical and digital actions enables managers to achieve real-time visibility into the value generated by complex business systems, allowing them to observe the direct impact of daily operations as they occur.

This real-time insight enables intervention in distant operations to ensure smooth execution and prevent negative outcomes that might only become apparent at the end of the process.



Process Intelligence and Undocumented Processes Visualization

Process Intelligence is particularly effective for visualizing and analyzing undocumented processes. Traditional tabular analysis falls short because it lacks the end-to-end vision necessary for comparative analyses of process variants. Instead, data visualization serves as a powerful tool for quickly understanding complex phenomena.

Process Intelligence leverages advanced data visualization techniques, inherited from classic business process management, to depict processes in a highly visual manner. These graphical representations allow for the identification of patterns and repeated inefficiencies, even within a tangled web of thousands of process variations. By using visual analytics, organizations can spot recurring issues and outliers without extensive prior development, aligning with the brain's natural "what-if" analytical approach. This capability makes it possible to analyze processes from every angle and drive continuous improvement.

Process Intelligence and Processes Exceptions

There is a universal law that governs the world of data. The Pareto principle, or the 80/20 rule, is an empirical approach which shows that, in certain areas, 80% of consequences are generated by 20% of causes. This means two things for process management:

1. By addressing 20% of possible cases in a decision tree, an expert can take into account up to 80% of potential situations in the possible combination of successive activities in a process.
2. Unfortunately, 20% of unexpected situations often generate 80% of work that can be described as 'hidden work', or 'operational inefficiency'.

By using Process Intelligence and applying the Pareto principle, it becomes easier to identify and address the deviating processes that generate these operational inefficiencies, ultimately enhancing overall process performance.

Visualization of steps in the process and quantification of periods between steps bring to light gaps between the theoretical process and what is actually happening.

How Does It Work?

The Origin of Process Intelligence

Process Intelligence is a recent technology that emerged following the digitization of processes and is a mixture of Business Process Management and data management technology (big data, data mining, machine learning, BI, and data visualization). Its development was enabled by the coming maturity of data science and the massive growth of digital flows.

Operating Mechanisms

The brilliant idea behind Process Intelligence is to exploit massive data processing capacities to develop process management, which previously used interviews and sampling to understand weaknesses.

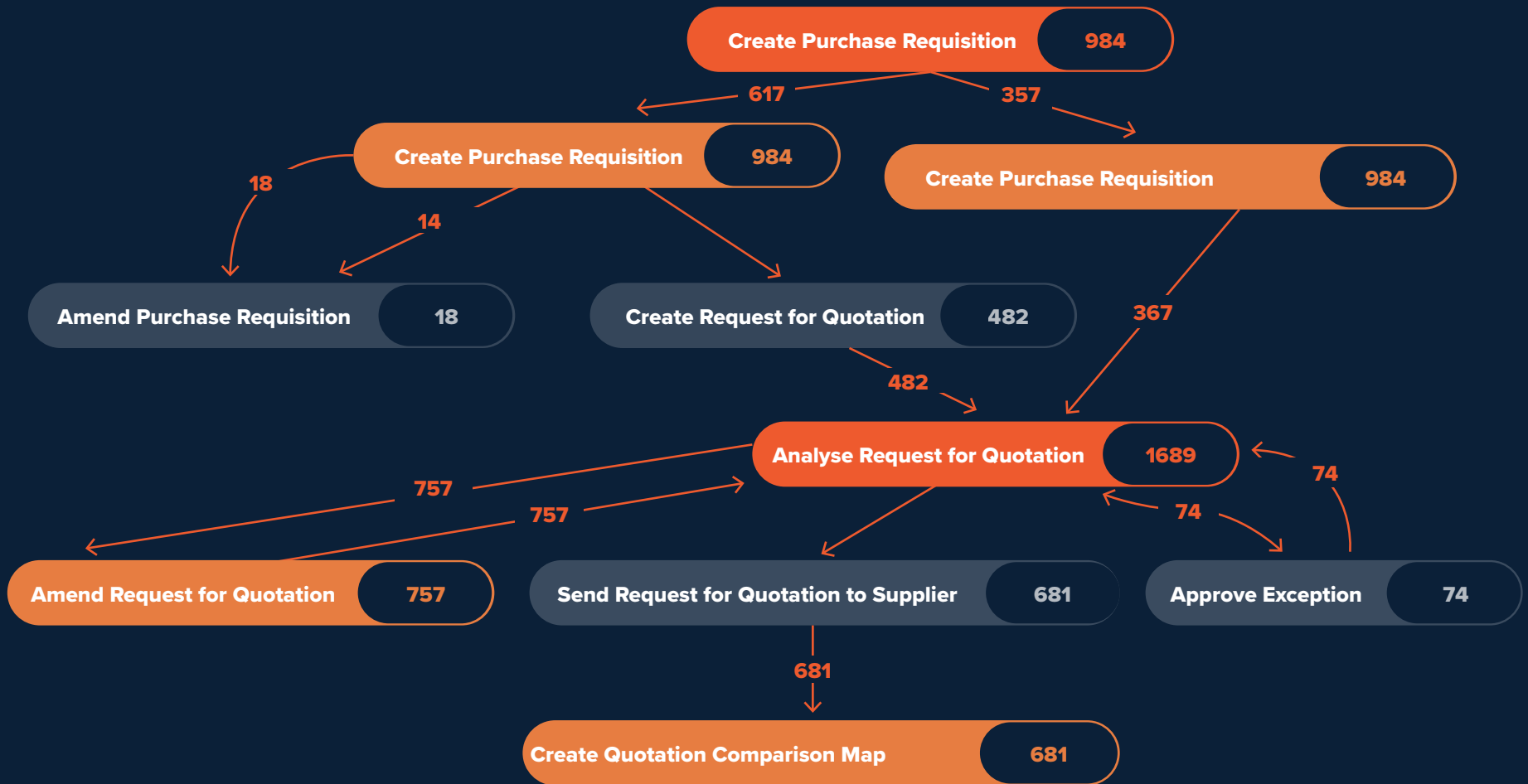
Thanks to the digitization of process transactions and massive processing capacity, it suddenly became possible to adopt an integral approach.



Raw data required to implement Process Mining

Timestamp	Activity	Case ID	Additional Information	
7/14/2011 6:20	Authorize Client's Invoice Payment	748	Tina Janssens	Financial Manager
7/14/2011 6:38	Pay Invoice	748	Annemie Van Ginneken	Financial Manager
11/20/2017 0:20	Create Inquiry Request	152	Karin Gielen	Financial Manager
11/20/2017 23:11	Analyze Inquiry Request	152	Jef Konings	RES Manager
11/20/2017 23:20	Create Inquiry Proposal	152	Rudy Schrauwen	RES Manager
11/23/2017 6:28	Analyze Inquiry Proposal	152	Kris Cassauwers	Purchasing Agent
11/23/2017 7:38	Amend Inquiry Proposal	152	Rudy Schrauwen	RES Manager
11/25/2017 4:16	Analyze Inquiry Proposal	152	Kris Cassauwers	Purchasing Agent
11/23/2017 7:38	Amend Inquiry Proposal	152	Rudy Schrauwen	RES Manager
11/25/2017 5:21	Amend Inquiry Proposal	152	Jef Konings	RES Manager
11/25/2017 16:57	Analyze Inquiry Proposal	152	Roland vanden Bussche	Purchasing Agent
11/25/2017 18:03	Amend Inquiry Proposal	152	Jef Konings	RES Manager

Global vision of the process in the Process Mining tool



The event log of each transactional application found in support of a process holds the data required for Process Intelligence. At least three types of information are required: **identifier, activity and timestamp.**

Identifier

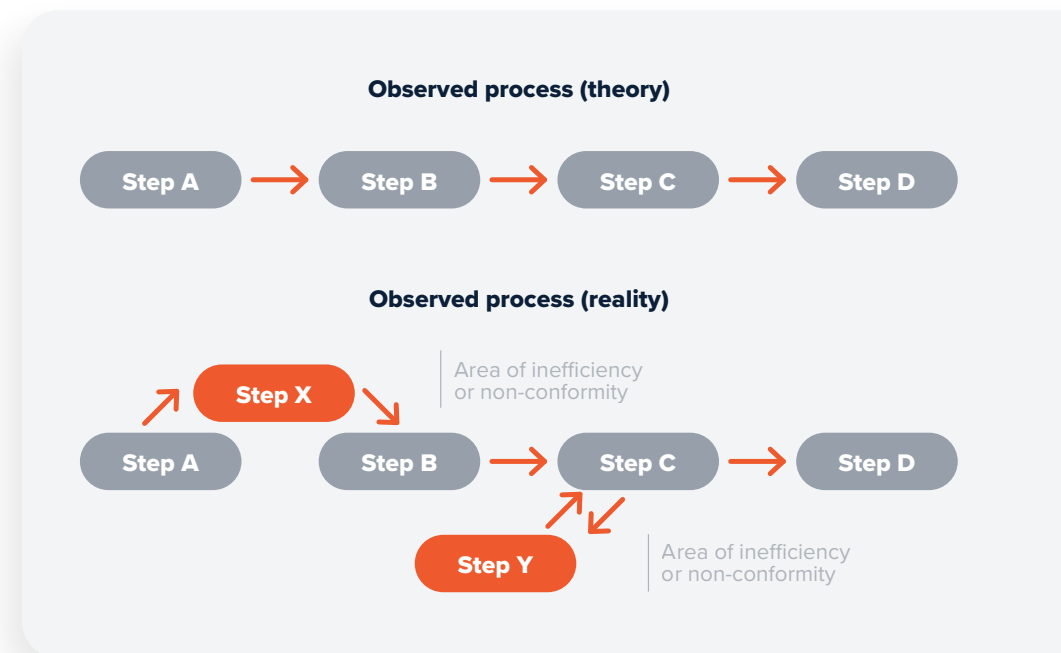
Which order or case is being looked at? This is what is tracked throughout the process to know its position at all times. It could be a maintenance request, purchase requisition, sales order, 3PL tracking number, etc. according to the process.

Activity

These steps form a process, connecting business expertise with system data. Business experts identify the key events, while engineers extract the necessary information from system logs. Often, the most common process flow only accounts for about one-third of the possible steps. Defining all possible variations, including alternative paths and deviations from the ideal process, provides a comprehensive, nuanced understanding and a full vision of the process.

Timestamp

Each step (activity) is linked to a specific time of occurrence. A primary function of Process Intelligence is to accurately reconstruct process sequences, even in complex scenarios involving loops and parallel tasks.



Visualization of steps in the process and quantification of periods between steps bring to light gaps between the theoretical process and what is actually happening.

This radical change of approach makes it possible to work with all types of relative analysis (i.e. between two situations or two elements), based on the millions of cases that have gone through the process.

Typical questions include: How many variants are there in the process? How many variants cover 90% of cases? What is the time difference between the ideal journey and anomalous journeys? What is the rate of automation of the various activities in the process? What is the cost of this operational inefficiency?

When it comes to performing these analyses, Process Intelligence offers a significant advantage in terms of ease of use and how simply data can be integrated and relevant indicators materialized.



Process smoothness

Studying process variants is the basic analysis in Process Intelligence. It makes it possible to visualize the homogeneity of the process. It is a standard analysis to determine where improvement efforts should be focussed. It would be pointless for example, to spend time automating a step that is only present in 1% of cases. On the other hand, if the analysis reveals that this step leads to a significant increase in the overall processing time, then a review action (automation, avoidance, alert) may be taken.

Conformity

Process Intelligence makes it possible to compare the theoretical process diagram with the reality of observed variants. This type of analysis makes it possible to detect process violations and determine the underlying causes of each one. The manager will then be able to use this analysis as the basis to observe whether actions taken reduce the process anomaly rate over time.

Hidden work

Process inefficiency is often caused by a lack of defined rules or safeguards for seldom occurring cases. When the case arises, a chaotic situation is

created where loops and backward returns can be observed between steps. To handle these cases, the manager will not necessarily revise the process rules but by using Process Intelligence this will generate alerts so that operational staff members become aware that a file has strayed off the optimal path.

This list of standard analyses is not exhaustive and dedicated indicators are often created for the specific business environment. For example, for a supplier payment process, a company that has received a late payment fine will focus its attention on deadline monitoring: valid invoices will then no longer be able to exceed the payment deadline, even if they have to be manually processed. In the case of a more digitally mature company, which already has a smooth-running automation and control system, it will, for example, focus on optimizing its rate of discounts for early payment.

More than just a tool, Process Intelligence is an engine for transformation and continuous improvement that covers a broad field of applications. Once we are aware of this, we can see the universal scope of this approach, which, like AI, can be applied in all businesses. Indeed, both of these technologies contribute to a more global vision of the future of work, which is sometimes referred to as 'hyper-automation' or 'intelligent automation'.



Harnessing Process Intelligence:

Identifying Outliers To Drive Operational Excellence

The Challenges of Over-Optimized Processes

For the past few decades, organizations have prioritized designing processes for maximum efficiency, striving to meet operational goals within the constraints of existing systems. While this approach has led to the optimization of working practices, processes and supply chain dynamics, it has also made them prohibitively complex, leaving businesses with little room for change without risking significant disruption. More concerning is the ‘operational blind spot’ created by complex processes, obscuring how they truly function. This lack of clarity can have serious implications for future business development decisions.

Ensuring Data Quality in Automation with Process Intelligence

Much has been said about the significance of process automation and its benefits, ranging from increased efficiency to cost reduction. However, automation is only as effective as the data that drives it, making the quality of your input data critical. Before considering automation, organizations must first ensure that the data feeding into automated systems is accurate, relevant and reflective of real-world operations. By highlighting process variants, Process Intelligence helps identify exceptional situations and define appropriate responses to them—situations that AI and machine learning may struggle to manage effectively due to their rarity and unique nature. This step is essential for ensuring that automated systems are prepared to handle the complexities of real-world operations.



Empowering Change Through Process Intelligence

Once processes are understood and defined, the next step is empowering the people who manage and operate these systems. The key to making meaningful and valuable changes lies in having the right knowledge. Process Intelligence provides the deep insights needed to understand the nuances of existing processes, allowing organizations to move beyond merely addressing the consequences of inefficiencies. By equipping employees with this intelligence, organizations create the opportunity for more effective process optimization and facilitate a shift from reactive problem-solving to proactive process improvement.

Building a Resilient Foundation

By incorporating Process Intelligence, organizations can achieve clear visibility into their operations, ensuring that processes accurately reflect real-world activities. This transparency not only enhances process design but also empowers employees with the knowledge they need to make impactful and effective decisions. As a result, businesses can build a resilient foundation that supports growth, adaptability, and long-term success.



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