As AI reshapes how work gets done, organizations with strong process frameworks are best positioned to lead and maintain operational rigor at scale.

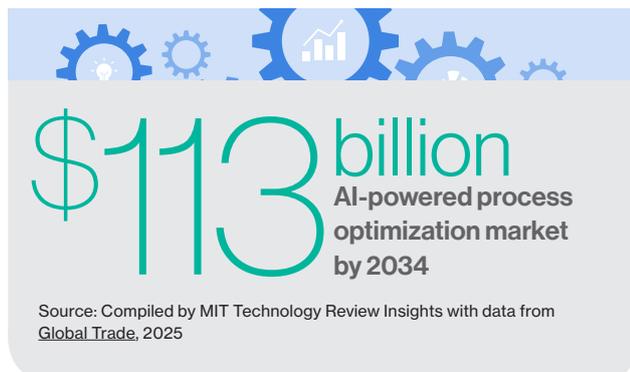# Achieving operational excellence with AI

Frameworks like Lean Six Sigma and business process management (BPM) first gained traction because they promised clarity in the chaos — a, structured way to bring order to messy, sprawling operations. Lean Six Sigma emphasized statistical rigor and quality control; BPM created end-to-end maps of how work should flow across departments. Both offered a repeatable way to embed habits of measurement, analysis, and accountability into day-to-day company culture.

But today, those time-tested playbooks are evolving as companies seek to **embed AI into established process excellence methodologies**. By some estimates, the market for AI-powered process optimization is projected to exceed **$113 billion within the next decade**. In one study, a full 88% of business leaders anticipated increasing investments into AI-infused process intelligence in the next **12 to 18 months**.

Yet without the right foundations, many of those investments may not fully deliver on their potential. Companies that already operate with discipline have an edge. They can channel new tools into proven systems rather than bolting them onto shaky foundations. Organizations with mature process disciplines are also better positioned to translate AI ambition into real outcomes, as they are already accustomed to data-driven decision-making and process discipline — precisely the cultural foundation AI systems need to deliver value.

Simply put: AI can accelerate process excellence, but existing process excellence is what makes AI truly impactful. Technology and process are no longer separate levers, and only organizations that pull them together stand to realize the full value of both.

$113 billion

AI-powered process optimization market by 2034

Source: Compiled by MIT Technology Review Insights with data from Global Trade, 2025

Key takeaways

1 Process frameworks are getting an AI upgrade, including automating routine tasks while simultaneously tracking KPIs, analyzing data and interactions, and generating recommendations or assets. Lean principles are finding new applications in digital environments, too.

2 Without the right foundations, including mature process disciplines and data-driven decision-making, enterprises risk not extracting the full value and benefits from their investments. AI is only as strong as the framework it plugs into.

3 Best practices for developing strong process disciplines include linking operational and support standards, institutionalizing cascading governance, equipping teams with consistent tools, and ensuring the right data is flowing to the right people.

How traditional process excellence frameworks are evolving

The American Society for Quality (ASQ) explains that traditional frameworks are getting a high-tech upgrade thanks to AI. "In a traditional BPM example, such as claims processing, you would define step-by-step handling of claims, [identifying] various tasks as part of that process — approvals, notifications, etc.," explains Jayet Moon, chair of the Delaware Section at the American Society for Quality. "Now, AI engines are able to handle these tasks automatically, while simultaneously tracking KPIs like time-to-resolution and error rates." This infusion, he adds, can lead to efficiency gains of up to 50%.

Beyond intelligent BPM (iBPM), other long-standing process methodologies are evolving for the AI era. Lean principles, in particular, are finding new applications in digital environments. "The core principles of Lean Six Sigma — which is a philosophy of waste reduction and gaining efficiency in the smallest of tasks — have never been more relevant," says Moon. "Lean places great stress on evidence-based decision-making, which underpins not just effective quality systems, but also effective business systems."

The same mindset that once eliminated bottlenecks on the shop floor is now helping companies reduce waste in their computing cycles. Moon's team applied Lean thinking to reduce AI deployment costs by turning off tokenization functionality during periods when it was not needed. Similarly, Lean methods such as value stream mapping are proving valuable as workflows span multiple platforms, giving organizations clear visibility into where value is created and where waste accumulates across digital systems.

The shift is part of a larger movement toward hyperautomation, where AI, process mining, robotic process automation, and orchestration tools create self-improving workflows. "These frameworks support agility, customer centricity, and compliance. And increasingly, over the last few years, they've integrated data science and automation into their toolkits," explains Moon. The next step, he adds, will be seeing where AI can take over more of the modeling, design, execution, monitoring, and optimization – areas where it is already well-positioned to accelerate results.

Proprietary process optimization in the AI era

If Lean and BPM are getting their high-tech upgrades, an adjacent evolution is happening inside organizations that have turned internal standards frameworks into an AI-fueled competitive differentiator.

"If you have no idea what is really going on in your processes, it's very naive to think that you can somehow solve your most important problems with AI agents."

Wil van der Aalst, a professor at RWTH Aachen University

Process mining: Bridging the gap between AI hype and operations reality

Wil van der Aalst, a professor at RWTH Aachen University and chief scientist at the process intelligence company Celonis, is often called the godfather of process mining—a discipline that reconstructs actual workflows from digital event logs. His research suggests that a shocking number of organizations do not actually know what is happening in their day-to-day workflows.

Before pouring money into AI pilots, says van der Aalst, enterprises need a factual, end-to-end picture of how processes really run—which is where process mining factors in.

"This is an important first step that organizations should take before they try to apply AI on top," says van der Aalst. "If you have no idea what is really going on in your processes, it's very naive to think that you can somehow solve your most important problems with AI agents." Asking a chatbot to diagnose workflow inefficiencies without mining event data, van der Aalst elaborates, is like asking it to add numbers without a calculator.

But via process mining, users can drill from an AI answer ("logistics caused 65% of OTIF (on-time in-full delivery, a supply chain metric) misses last week") straight to the underlying event logs. By reconstructing digital event logs from across systems, process mining reveals how orders, invoices, machines, and customer interactions actually flow—not just how managers assume they do. Next-generation, object-centric mining takes this further, linking multiple entities into a rich "process intelligence graph" that AI can reason over.

For van der Aalst, that marriage of fact-based computation with natural-language AI is where the real breakthrough lies: systems that don't just generate plausible answers, but ground every recommendation in verifiable reality.

Digital business services company, TP, has two proprietary process optimization models that anchor how work can be done more efficiently at scale across the enterprise: TP Operational Processes & Standards (TOPS) for frontline operations and Baseline Enterprise Standards for TP (BEST) for support functions. "In both, we are driving AI momentum as a company that applies these principles daily across geographies, industries, and at large volumes and scale," says Christian Buschmeier, global chief standards and process officer at TP.

That forward-looking mentality manifests in day-to-day operations. Supervisors may receive AI-driven recommendations for next-best coaching actions to improve employee performance, while AI engines generate fair and efficient shift schedules based on business needs and agent availability. In quality management at TP, AI systems now analyze nearly 100% of customer interactions to surface issues and highlight new sales opportunities. Human agents then use those insights to refine their approach.

High standards are the foundation that makes both TP's high-tech (automation, AI scheduling, real-time quality monitoring) and high-touch (coaching, empathy, people development) strategies effective, notes Buschmeier. "Standards are the engine that makes all the technology and all the different processes [function]," he says. "If, as part of your culture, you don't have high standards and process excellence top of mind, whatever technology you put forth as part of your framework will never work. Process excellence is what enables us to transform functional technology into real value for our customers."

An equally important dimension is the balance between AI and emotional intelligence (EI). AI enhances decision-making speed and accuracy. EI ensures that change

88% of business leaders expect to increase AI-infused process intelligence

Source: Compiled by MIT Technology Review Insights with data from the World Economic Forum, 2025

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lands the right way with employees and customers alike. And structured standards maintain consistency across both facets.

Sid Bhatnagar, CEO of ASQ, reiterates the enduring importance of the human element in this equation, especially as AI becomes more entrenched. "AI is not a silver bullet. It's not going to solve everything just by turning it on... It really does take change management practices, root quality principles, and continuous improvement principles to be able to set up an infrastructure that can be scalable. You can't neglect the human capital aspect of it, the right skill sets that are needed, and investing in the skillset."

Best practices for process excellence in the AI age

AI may be the flashiest tool in the kit, but it is only as strong as the framework it plugs into. The organizations pulling ahead are those that treat AI as an accelerant to long-standing process disciplines.

To make that advantage real, a handful of best practices stand out:

• **Link operational and support standards.** Organizations often differentiate between operational standards — those that govern how frontline staff interact with customers — and enterprise standards for support functions such as recruiting, workforce management, and training. The most effective models ensure these two domains work in tandem. For example, recruitment standards should be aligned with the types of queries
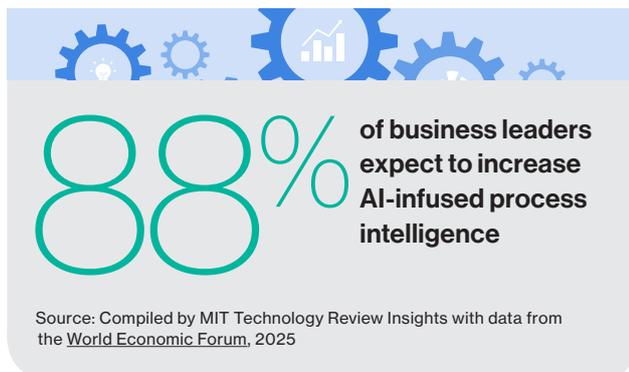
frontline agents will actually face, and workforce management standards should directly support service-level delivery goals.

• **Institutionalize cascading governance.** Strong governance is not always synonymous with rigid oversight, but it does mean that clarity and consistency are prioritized across every level of the organization. A layered cadence of performance management — for example, monthly leadership reviews to assess strategy, weekly manager-level sessions to translate plans into action, and daily supervisor huddles to address immediate issues — helps create that clarity.

• **Equip teams with consistent tools.** Consistency is a hallmark of process excellence. Organizations can support it by arming managers and employees with standardized playbooks, onboarding guides, and user-friendly digital dashboards. These tools reduce variability in how processes are applied, make it easier to train new employees, help maintain quality across dispersed teams, and enable fair performance comparisons across regions or departments. Consistency also creates a shared language for improvement — everyone knows what "good" or "great" looks like, and everyone uses the same yardstick to measure it.

TP's unique approach to process excellence enables enterprise AI at scale

TP has its own proprietary approach to process excellence, which the company combines with established frameworks like Lean Six Sigma. Today, that foundation is supporting AI adoption at scale across TP's global operations.

TP's approach to process excellence centers on two interlocking pillars: TP Operational Processes & Standards (TOPS) and Baseline Enterprise Standards for TP (BEST). Together, these frameworks define the rules of the game so that frontline and back-office teams can operate in sync. By standardizing how work is planned and executed across all facets of the company, TOPS and BEST help create the necessary structure to deploy AI tools across multiple teams, functions, and geographies.

TOPS acts as a playbook for daily operations, monthly management reviews, weekly coaching touchpoints, and supervisor-led huddles that cascade strategic priorities into actionable steps. BEST, meanwhile, governs departments such as recruitment, training, and workforce management. A BEST-aligned hiring process, for example, profiles candidates against actual customer interaction patterns, while training curricula and onboarding packs are designed to flow seamlessly into TOPS routines.

Layered on top of these standards is Lean Six Sigma, a time-tested discipline used by enterprises around the globe. With structured yellow-, green-, and black-belt training, biweekly project audits, and an AI-powered "copilot" to guide DMAIC projects (define, measure, analyze, improve, and control, a core methodology in the framework), Lean Six Sigma helps ensure that TP's innovation and AI strategy has a healthy infusion of process diligence.

Over 40 years, TP has refined this model, updating standards annually and codifying global best practices into a seamless One TP experience.

AI may introduce unprecedented speed and sophistication into enterprise operations, but it does not replace the need for discipline. Organizations that have already built the muscle of process excellence can channel AI into proven structures; those still patching together ad-hoc approaches will find that AI only magnifies fuzzy governance or fragmented workflows. In short: This revolutionary technology, for all its promise, is only as sound as the framework it operates within.

• **Treat data like a team sport.** AI thrives on data, but the right data must flow to the right people. Organizations should combine diverse sources – operational KPIs, quality metrics, customer feedback, and even employee input – to form a holistic view of performance.

Employees at all levels should be empowered to identify patterns, raise concerns, and propose solutions.

Beyond these general principles, best practices are also evolving to reflect the unique demands of AI:

• **Embed change through training and smart scaling.** Too many AI pilots fail to scale. Successful organizations treat deployment as an enterprise-wide journey, pairing technical rollouts with robust upskilling programs. Training builds confidence and helps frontline staff understand how to work alongside AI instead of feeling displaced by it.

• **Support organizational shifts.** AI requires tighter collaboration between operations, IT, and analytics teams. By breaking down silos and aligning process improvements with business strategy, organizations can position AI insights to translate into action.

• **Prepare for the future of frameworks.** Finally, organizations should experiment with emerging tools, such as AI agents to support Lean Six Sigma projects or hyperautomation platforms that combine process mining, robotic automation, and orchestration. These technologies can provide richer insights and manage increasingly complex workflows, keeping process excellence relevant in the next wave of transformation.

AI may introduce unprecedented speed and sophistication into enterprise operations, but it does not replace the need for discipline – it amplifies it. As companies work to incorporate AI systems into legacy frameworks, instituting established standards, strict governance, and clear processes is imperative not only to implementation success, but to the bottom line. Additionally, companies that attempt to treat AI technologies as an add-on to existing stacks risk accelerating inefficiencies at scale. Successful companies embed AI within mature, well-governed frameworks – they understand that the next evolution in AI technologies will require a new level of operational rigor.

"Standards are the engine that makes all the technology and all the different processes function. If, as part of your culture, you don't have high standards and process excellence top of mind, whatever technology you put forth as part of your framework will never work."

Christian Buschmeier, Global Chief Standards and Process Officer, TP

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