



Spotlight / Generative AI

How to Marry Process Management and AI

Make sure your people and your technology work well together.

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When Mars Wrigley decided to digitize its supply chain, it invested in several AI and analytics capabilities. It built a digital twin of its production line (a virtual replica simulating its operations in real time) and fed data from it into a machine-learning model to predict the line's output and reduce overfilling and waste. It worked with a “decision intelligence” vendor, Aera Technology, to create visualizations of the data, generate recommendations about preventive maintenance, and

automate some operational decisions. It hired Kinaxis, a vendor whose AI software gave the staff suggestions on how to balance supply and demand, automate invoice processing, and increase truck utilization by 15%. As a result of all these improvements, the company was able to fill orders more quickly, and customer service ratings rose by a couple of percentage points.

More recently, Mars Wrigley began building machine-learning models that forecast sales, which will help factory managers set production levels. On the manufacturing line it plans to deploy smart robots and new AI systems to improve efficiency and sustainability. In sum, Mars Wrigley has been using AI to reimagine process management in a wide range of operations.

Process management isn't a complicated concept. Its goal is to understand how a sequence of tasks fit together to create a specified outcome and then to make improvements. It can be applied at multiple levels—to work performed by individuals or by a small group, key activities within a department, or end-to-end processes that cross the entire organization and even company boundaries.

Done correctly, process management is extremely effective. Better-managed processes mean higher productivity: Error rates, cycle times, and low-value work are all reduced. But it can be difficult to implement on a large scale—even with a boost from artificial intelligence.

AI supports narrow tasks or subprocesses, rather than end-to-end processes, so organizations must string together multiple AI use cases to improve an entire process. Process management requires massive amounts of change management—persuading stakeholders, retraining workers, and integrating many moving parts. Moreover, it's often at odds with traditional hierarchical management because it cuts across departments to boost efficiency. And its reputation took a hit when

process reengineering became a fad that left too many failed projects and mindless layoffs in its wake in the early 1990s. No wonder it fell out of favor.

At the same time, AI and other information technologies have also disappointed companies when it comes to generating productivity gains. Robert Solow's 1987 comment that "you can see the computer age everywhere but in the productivity statistics" is sadly still relevant. Organizations have invested trillions of dollars in data and the technology to analyze and enhance productivity but have little to show for it. Most organizations don't even have ROI figures beyond productivity metrics for IT projects.

A new approach to process thinking can help reverse this situation.

Indeed, new ideas about processes—including scientific management, statistical quality control, total quality management, Six Sigma, agile, and lean methodologies—have a rich history of impact. The fact that new thinking about process management keeps emerging is testimony to its importance. There's a constant need in organizations to improve operational performance, and managing processes is a reliable way to do so.

We, the authors of this article, are proponents of all forms of process management. One of us, Tom Davenport, helped launch the [process-reengineering movement](#) in the early 1990s. The other, Tom Redman, has applied process thinking extensively in his data advisory services. After extensive conversations with hundreds of leaders, we've arrived at a new philosophy about process that captures how people, data, analytics, and technology—especially AI—can come together to strengthen business performance.

In this article we'll describe that new philosophy and detail the first steps senior leaders should take to apply it.

How Technology and Process Management Enhance Each Other

A lack of technology support—particularly in incremental process improvement approaches like lean and Six Sigma—contributed to the decline in the popularity of process thinking. But over the past several years new technologies have created opportunities for organizations to transform process management. This is a key reason that we argue that companies should now return to employing it broadly.

Process management and technology are mutually reinforcing. New technologies help companies significantly scale up improved processes, and it's much easier to deploy and get value from a new AI algorithm when the process it supports is well-defined and well-managed. End-to-end integrated processes also make it easier to obtain the huge quantities of high-quality data needed to train AI.

Good process management requires departments to adopt common data standards and share data freely across an organization, although many departments may be reluctant to do so. After all, they've implemented systems tailored for their specific needs, not necessarily for end-to-end effectiveness. When departments don't coordinate their data, however, it often leads to problems.

Consider an operations department whose job is to assemble the various components of orders. Its employees receive orders from the sales department but quickly find lots of holes and errors. So they do their best to clean up the data—after all, they have key performance indicators to meet. One can't fault sales, which has no idea that the data it provides is bad. Still, the people in operations have to spend a lot of time on a task for which they've received no training or support,

often under enormous pressure. The obvious solution is to make fewer errors in sales, but operations people, trapped in their silo, don't see the opportunity.

Process management helps bust or at least bridge such silos. It shines a harsh light on errors and the inefficiencies they cause, motivates improvement, and provides the structure needed to systematically eliminate the causes of mistakes.

Where to Begin

Organizations without a strong process orientation may have difficulty getting started. In that case it may be best to focus initially on one or two processes that are critical to performance and address the rest as the organization becomes more used to process thinking. Many companies we know start with order-to-cash (OTC) processes—which encompass all the steps from when a customer places an order to when payment is received. They have a crucial impact on performance at most companies and are a popular target for reengineering.

European companies have managed OTC and other cross-functional processes for years. Siemens, despite having highly decentralized business units, has created common OTC subprocesses in areas like order management and purchase-to-pay. BMW has standardized most of its global production processes, which used to vary greatly around the world, and has now focused on optimizing support processes. The consumer products company Reckitt is streamlining the entire OTC process by using process mining and process automation to improve invoicing, the purchasing of supplies, order fulfillment, and more. These companies have made IT-enabled process management an essential aspect of their operations.

In North America, in contrast, companies generally have taken a much more incremental approach. Uber focused first on customer service, PepsiCo on accounts receivable and payable processes, Cardinal Health on order management, and Johnson & Johnson on its supply chain. All have made significant improvements with this narrower focus. As we mentioned earlier, this is a good way for organizations that don't have a strong history of process management to get started.



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Now we'll use OTC to explain how AI can fit into process management, walking readers through how to apply it—including how to address the difficulties they will inevitably encounter.

Step 1: Establish ownership. The first goal is to bring together a team of managers willing and able to take end-to-end responsibility for the performance of the process. That means naming a “process owner” to coordinate the work required and recruiting a team of “process managers” from the departments involved. For OTC processes, the team will include people from sales, operations, shipping, and finance, and other areas may contribute as well. These employees must be able to speak for their departments and advocate for the interests of the entire organization.

Naming the right process owner is important. That can be tricky because it's an entirely new senior management role in most cases. The best owners will know how to exercise influence without formal authority; at the beginning of the process journey they may not have much of the latter.

And there's another challenge that makes process management difficult: Because it tends to be aligned with the priorities of customers while day-in, day-out line management tends to be aligned with the priorities of the boss, conflicts are sure to arise. Employees will inevitably need guidance on how to answer the question “When time is short, who's more important, my boss or the process owner?” Salespeople, for instance, encouraged by their managers to enter orders for which the buyer demands delivery in 10 days so that they can meet their sales quotas, will be in a tough spot when the process owner advises that inventory is low and a more realistic delivery date is 20 days.

Step 2: Identify process customers. At the beginning of an initiative, process managers should always ask, “Who are the customers? What do they want, and what do they need most? How do we deliver it?” Any gaps or uncertainties in the answers signal opportunities to fundamentally rethink the process.

The people who ultimately get value from the process may be internal or external. With OTC, it’s easy to identify the primary customers: People who buy the products or services, who need to receive them in top-quality form, on time, and where expected; and the company, which needs to manage cash.

There may also be secondary customers. Marketing, for instance, may be one of the OTC process if it wants to position the company’s on-time delivery performance as a competitive advantage. Another customer could be a sustainability group that wants to reduce the company’s carbon footprint. Herein lies one of the beauties of process management—it forces managers to determine priorities and then to align work with them.

Technology can help companies capture and analyze customer data and the customers’ views on the current performance of processes. Customer relationship management systems can provide insights into customer attrition, numbers of service requests, and customer profitability. Generative AI systems can analyze and summarize customers’ comments in inbound service calls, emails, and social media posts—and are getting better at it all the time.

Step 3: Map out the existing process. Next you need to develop a high-level flowchart depicting the current process, including the physical movement of goods and the creation, flow, and use of data. This work

used to be done manually with Post-it notes representing tasks on whiteboards, but today AI can automate it.

We find that descriptions of the interfaces between departments are especially useful, particularly early on. Often these interfaces lie in a “white space”: They’re not clearly the responsibility of any one department and, as such, are likely sources of delays, errors, and inefficiency.

Process mining, which extracts process data from IT systems for modeling, analysis, and business optimization, can be enormously helpful during this step too. This technology, which wasn’t available during earlier waves of process management, uses information gathered from enterprise-system log files to see how an organization’s processes are performing. With OTC, for instance, companies can find out almost in real time what computer-mediated tasks are underway and how long it’s taking to fill an order, deliver a package, and get paid by a customer. Process mining can highlight the pain points a redesign should focus on. Once those have been uncovered, the team can try “task mining,” which is offered by some technology vendors and typically focuses on improving smaller processes through automation.

New technologies help scale up improved processes, and it’s much easier to deploy and get value from AI when the process it supports is well-defined and well-managed.

PepsiCo started its process-mining efforts with the accounts payable process in 2019. Since then the company has shaved thousands of hours of human labor off that process each year and reduced write-offs by

millions of dollars. Now the company is using process mining (from the vendor Celonis) across nine more processes, including broad end-to-end ones like OTC. Some activities, including the creation of messages to customers on overdue receivables, have been automated within these processes. AI was used to identify the biggest problems to address, such as an initial 30% order-rejection rate when PepsiCo installed a new SAP system. Thanks to process mining with AI, the rejection rate dropped to 4%.

Step 4: Establish process-performance measures and targets. The next step is to define and put in place the metrics you need to manage the revised process. For OTC, end-to-end cycle times (how long it takes from the placement of an order to the receipt of payment), customer satisfaction, data accuracy, and process efficiency are especially important. Companies should also determine what level of improvement to the existing process is needed. During the reengineering movement, 10-fold improvements were often sought, but with the lean and Six Sigma methodologies, goals became much more incremental. Instead of setting arbitrarily large or small goals, companies should base targets on what is needed and what seems possible.

Analysis of the performance metrics for the current process may also provide insights that can help drive the design of the new process and the use of technologies to enable it. One telecom firm, for example, determined that it took about 90 days to deliver a particular type of service. Digging deeper, it found that the actual work time was about 10 days, with the remaining 80 days spent waiting between steps. Sorting out how to better coordinate the work helped the firm eliminate 60 of those days, which made customers happier and got cash in the door much faster.

Step 5: Consider process enablers. Robotic process-automation tools, which are sold by Microsoft, UiPath, and other vendors and use bots to automate repetitive and routine workflows, are likely to be helpful with the design of small processes; both generative AI and traditional machine learning can enhance the performance of larger ones. With OTC, for instance, generative AI can draft contracts, help customers make more-accurate orders, and alert them about delivery changes. Traditional machine learning can help companies optimize pricing, speed up credit approvals, prevent fraud, and estimate needed staffing levels.

Other new technologies may also be relevant. Internet-of-things sensors may be used to monitor manufacturing equipment and prevent failures, and blockchain can be used to track the movement of goods along a supply chain. Traditional business analytics can also improve decision-making throughout processes.

Step 6: Redesign the process. The redesign should be led by a cross-functional team made up of people from the departments involved in the process in question. The goal is not just to map out a better workflow but also to identify the skills, technologies, and organizational structure changes needed and the expectations of partners and customers.

While designing processes was once a highly labor-intensive activity, today AI has made that work much faster and more efficient. One long-term vendor of process-management software, Pega, for instance, has created tools that use generative AI to draw best-practice process designs from a library and suggest them to design teams.

One of its customers, Deutsche Telekom—the largest telecommunications company in Germany—used a new tool from Pega called Blueprint to rebuild its HR processes and the systems that

support them. Over the years Deutsche Telekom had established some 800 HR processes across more than 20 countries, and their complexity was daunting. It had initially addressed many HR subprocesses using traditional design and systems-development tools, but progress had been slow. Misunderstandings between people on the business side and in IT were causing delays, but Blueprint helped eliminate them with a simple communication interface that allows business experts to describe processes in their own words. Blueprint also made suggestions about things that the redesign team might have overlooked and created process templates, greatly reducing the time it took to find solutions and improve workflow systems.

With the help of Blueprint, the company has already streamlined 250 processes, and plans are in place to tackle the remainder. Employee satisfaction has increased and HR personnel have been freed from repetitive tasks, giving them more time to provide the staff better service. The business has also saved many millions of euros in application operation and management costs. The combination of generative AI and business expertise is transforming how process design is being done at Deutsche Telekom, and we believe it will do so at many other organizations.

Other tools that we have high expectations for are generative-AI-based image-creation capabilities and generative design tools (which are currently used by architects) and digital twins. We predict that they will help teams imagine new process designs, simulate them, and in time optimize process design and flow.

Step 7: Implement and monitor the process. As we mentioned earlier, rolling out new process designs requires considerable effort. Though software and AI-based tools can be used to automate key tasks within the new process, employees will need training, data will need to be

integrated, systems will need to be built, and customers will need to be briefed. Implementation may take months—but it should not take years.

After an improved process has been put in place, companies must establish a new normal in which control and continuous improvement prevail. The essence of control is predictability—confidence that process performance will not deteriorate in the future. It is the antithesis of firefighting, which is the norm all too often.

Process mining is perhaps the single most valuable tool for monitoring process performance and establishing control. It will uncover the variations that all processes exhibit. Excessive variation should be investigated and eliminated. For instance, in OTC, companies may use multiple carriers to make final deliveries. One lower-cost but less reliable carrier will add enormous variation. That's why as part of its supply chain redesign, Mars Wrigley turned to a fourth-party logistics company to work with carriers, monitor their performance, and ensure reliable delivery.

Process mining can identify the most important and costly problems to address. It should be constant because the only thing that's certain in business is change. New customers have new needs; new products require special treatment; new regulations require new reporting; new technologies, such as those for managing inventory, may offer productivity gains; and so forth. Smart process-management teams stay ahead of these developments and strive to keep improving processes—even radically redesigned ones.

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The reasons for companies to employ process management are greater and the difficulties of doing so are smaller than ever before. The

virtuous cycle of better data, easier technology implementation, and productivity gains has increased the payoffs, while numerous new technologies now make the work faster and easier. And though the focus on process has fallen out of favor, those who've maintained it have reaped the benefits. We believe that all companies should give process management a hard look and that it's essential for firms that are serious about AI.

Executives need to think broadly about how people, data, technology, AI, and analytics come together to improve business performance. Process needs to lie at the core. After all, it's through processes that organizations deliver value. It's time for senior managers to put process back on their radar screens and begin to sort out how to make it better in their departments.

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