



**START IMAGINING
A FUTURE OF
HUMAN +
MACHINE**

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Advances in artificial intelligence (AI) are ushering in a third wave of business transformation.

Savvy organizations will ride the wave to success. Unprepared organizations are likely to get swamped. The evidence suggests that most organizations are in the latter category.

In the first wave of transformation, businesses *standardized* processes. Think Henry Ford and the assembly line, where steps in the overall process were broken down, measured, and optimized to achieve gains in efficiency. The second wave of transformation brought *automated* processes. Think business process reengineering powered by advances in information technology like desktop computers, large databases, and software that automated various tasks. Now, the third wave is bringing *adaptive* processes. Think of mobile map apps that continuously use real-time data to create living, dynamic, optimized maps that get hundreds of thousands of individual users to their destinations as quickly as possible. And then imagine that principle of adaptability extended to business processes across all industries, organizations, and functions—that's the third wave that is transforming business as we know it.



It's About Human-Machine Collaboration

Less than 10 percent of companies are currently riding the third wave. That's what we found in a quantitative survey of 1,090 companies and a qualitative analysis of 450 case studies. Many companies believe they're riding the third wave—rebranding analytics initiatives or internet of things (IoT) efforts as AI. Or they see robotic process automation (RPA) as the cutting edge because it can analyze and adapt to unstructured data as well as a sudden influx of data. But RPA simply performs digital office tasks that are administrative, repetitive, and largely transactional within a workflow. In other words, RPA simply automates existing processes.

Adaptive processes promise entirely new, innovative ways of doing business. Building on the revolutions embodied in assembly lines and digital information technology, adaptive processes are driven by real-time data rather than a predetermined series of steps. The most productive of such processes are not simply set-it-and-forget-it automation that no longer requires the services of human beings. Rather, they derive their power from ongoing collaboration between humans and machines in what we call the “missing middle”—“missing” because no one talks about it or analyzes it, and only a small fraction of companies are working to fill this crucial gap.

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In this huge, dynamic, and diverse middle created by the third wave, humans and machines collaborate to attain orders-of-magnitude increases in business performance, each augmenting the other and achieving far better outcomes than either could achieve alone. For example, rigid assembly lines are now giving way to flexible teams of augmented humans and machines—teams that continually adapt on they fly to new data and different human contributions.

The third wave isn't confined to manufacturing. A global bank's anti-money-laundering system automatically flags a suspicious, complicated financial transaction and a human expert judges whether it warrants further investigation. At Gigster, a startup that helps assemble ad hoc software project teams for clients, AI can automatically put a program developer in touch with others grappling with a similar problem, thus placing a premium on human collaboration. Unilever, in hiring employees, deploys a range of AI technologies, including one that analyzes the speech and body language of candidates in a video-recorded interview. Candidates who make it to the next round are invited to company offices and assessed by humans who make the final hiring decision. The average time for someone to be hired has plunged from four months to just four weeks; the time recruiters spent reviewing applications plummeted by 75 percent, although job applications doubled; and since the system was installed, the company has hired its most diverse class to date.

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Begin with the Right Mindset

Companies like these are leading the way by reimagining processes. Reimagination begins with the mindset of the organization. To radically rethink processes around human-machine collaboration you must first jettison three deeply entrenched habits of mind: 1) focusing on individual steps in a process as candidates for automation, 2) thinking in terms of rigid, statistically controlled SOP processes, and 3) thinking in terms of machines supplanting humans. If you simply accept an existing process and then use AI to automate it, you will achieve little more than incremental improvements.

To attain step-level performance you must envision novel ways of accomplishing work in the “missing middle, where people improve AI and, in turn, smart machines give humans superpowers. To accomplish this objective, we recommend a three-step method: discover and describe, co-create, and scale and sustain.

Discover and Describe

Don't get stuck in old ways of thinking. Recognize that change is no longer episodic and human-led; it's self-adaptive, based on real-time input from humans as well as machines. Roles are not just limited to human-only and machine-only positions; they must also include collaborative work. And decisions don't only occur where work is performed by people; they must also take place where humans and machines collaborate.

From that perspective, you can begin to discover and describe what a reimagined process would look like. You might start with a methodology like design thinking to identify your customers' true needs. What are the "pain points" in the customer experience? The pain point might be a cumbersome, lengthy internal process or it might be a frustrating, time-consuming external process.

Identifying opportunities for reimagination takes time. You must capture the current business context, distill insights from various observations, and identify the potential value impact of the reimagined process. AI itself can be very useful in augmenting an executive's own powers of observation to spot previously hidden patterns of opportunity in the data. For example, you could use advanced machine-learning algorithms to sift through hundreds of data sources, including customer emails, social media posts, and digital exhaust to identify where process imagination could be most effective in removing a major customer pain point. Often, identifying such opportunities for process reimagination is an iterative process that involves continually asking how you can transform the customer experience through the use of AI and real-time data.

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Consider how a large agricultural company iteratively arrived at an AI process that would solve a major pain point for farmers. The AI system the company was contemplating would have access to an enormous amount of data from a variety of sources, including information on soil properties, historic weather data, and more. Initially, the company planned to develop an application that would help farmers better predict their crop yields. But through further research and observation, executives identified a greater pain point than the unpredictability of yields. What farmers really wanted was real-time, adaptive recommendations, including specific advice on which crops to grow, where to grow them, how best to treat the soil, and so on. The company then developed a system and tested it on about 1,000 fields. The initial outcomes were promising—the farmers were happy with their crop yields. Data from that initial test was then used to improve the system’s algorithms. Through this iterative process the company moved from a system that was of relatively low value to farmers to a system of much greater value.

Co-create

Once opportunities for process reimagination have been identified, you can begin to develop new work models by encouraging co-creation. That means having all parties in the work help envision how it might be accomplished through human-machine collaboration.

Imagine, for example, a technician at an Audi dealership who encounters an engine problem he can’t solve. He calls Audi of America’s technical help line, which fields about 8,000 calls per month from more than 290 dealers across the country. Most of the time, remote technicians can troubleshoot problems over the phone, but in about 6 percent of cases an expert technician has to be dispatched to the dealership in person. The solution is effective but it’s inefficient. Travel time can take between two hours to two days. Meanwhile the customer waits.

The need for expert technicians isn't going away anytime soon. Even though cars are becoming more reliable, they are also becoming more digitally complex, requiring mechanics to be IT specialists, too. The combination of increased reliability and increased complexity means that most dealer technicians rarely see some of the more challenging technical problems that arise in newer models. While this might help explain why customers could on occasion have to wait hours or days to get their cars fixed, it does little to ease their frustrations.

Through co-creation, Audi found a better way to train mechanics and make the expertise of their expert technicians available to remote dealerships, thus minimizing customer wait times. The innovative solution was made possible through the involvement of the expert technicians, mechanics, and AI technologists providing continual feedback for what was working and what wasn't. What emerged was a fleet of telepresence robots called Audi Robotic Telepresence (ART) that not only helps train technicians in diagnostics and repair, but also speeds up the time it takes to make repairs in the first place.

With ART, the voice and face of the expert technician is beamed to any Audi dealership, where it is emitted from ART's speakers and high-resolution display. The expert technician, in his office, remotely controls a robot that rolls, swivels, sees, hears, and scoots right up next to a technician on-site as he or she peers under the hood. Vision sensors on the mobile robot ensure safe operation, which helps establish a sense of trust with the humans it works alongside. Moreover, the video and voice communication network between the expert and technician is supported by AI behind the scenes to enhance collaboration between the mechanic and the remote, robotically embodied technician. In real time, the expert technician can offer advice on improving diagnostic and repair techniques. Dealer technicians learn on the fly; expert knowledge can be deployed instantly, across the country; and customers get their cars fixed faster.

Scale and Sustain

You must also scale your solution and sustain it with continual improvements. Audi first conducted an experimental pilot program for ART at 18 dealerships, then extended it to many more dealerships in the ensuing months. Thanks to the success of that effort, the company had plans to roll out the robots in all its US dealerships by the end of 2016.

Alternatively, you might test a new system internally on employees to work out all the kinks before implementing the application externally to customers. The Swedish bank SEB first deployed its virtual assistant, Aida, as a help-desk agent to assist 15,000 SEB employees to work out the kinks and improve it before rolling it out to the bank's one million customers. Amazon pursued a similar strategy in developing its cashier-less convenience store, Amazon Go, where purchases are automatically charged to the customer's Amazon account, making shopping almost as easy as pressing Buy Now on the company's website. Amazon first tested the concept with Amazon employees in a Seattle store before opening it to the public in January of this year.

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A Call to Action

Changing the mindset of the organization is only the beginning of a framework for action. You must also:

- **Foster an organization-wide culture of experimentation.** The age of standard business processes is over; companies can no longer aim to replicate the best-in-class process of an industry leader.
- **Exercise proper leadership in promoting AI.** You must make a commitment to responsible use of AI, always considering the ethical, moral, and legal implications of the AI technologies you deploy.
- **Build a “data supply chain” to fuel intelligent systems.** Accumulating and leveraging the extensive amounts and variety of data is one of the biggest challenges organizations face in deploying AI.
- **Develop the “fusion skills” necessary for reimagining processes in the missing middle.** Our research has found that the real issue isn’t that humans will be replaced by machines; it’s that humans need to be adequately prepared to fulfill the growing number of jobs in the missing middle.

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As this framework suggests, executives have their work cut out for them. We predict that AI will be a decisive factor in business, separating the winners from the losers. Those companies that use the technology to augment their employee capabilities and reimagine their business processes will achieve step gains in performance, propelling them to the forefront of their industries. Firms that continue deploying AI merely to augment their existing processes will fall farther and farther behind.

The stakes are exceptionally high. The fate of many people, firms, industries, and countries will depend on the solutions we implement. **To make good on our responsibility to all of those stakeholders it's time to discard our old notions of human versus machine and instead focus on a future of human + machine.** 📖



Info



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