

THE 2025 IMPERATIVE: INTELLIGENT AUTOMATION NOW

**Why Delaying Technology
Implementation to Improve
Business Processes Could
Disadvantage Organizations**

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Putting Artificial Intelligence to Work

Despite decades of technology advancements that have positively impacted corporate information systems, most of today's business processes can be further improved through *intelligent automation* (IA)—the process of using artificial intelligence (AI) to create hardware and software systems that work autonomously, learn from their experiences, and adapt to moment-to-moment conditions.

As the following report from Harvard Business Review Analytic Services explains, most organizations are either currently pursuing or planning to pursue IA projects—albeit with some uncertainty. How do you turn initial IA visions into working systems? How do you integrate new IA functions with existing applications? And how do you scale these automation initiatives across the enterprise?

Successful IA projects depend on three essential drivers: **automation, cloud infrastructure, and advanced analytics**. These three engines of progress must work in unison to achieve effective outcomes.

Focused Automation: Artificial intelligence can be incredibly useful when applied to targeted domains, such as a database that can detect cybersecurity breaches by distinguishing normal from abnormal behavior. These *autonomous* systems are not only intelligent but also self-governing, which means they can carry out multiple automated sequences without human initiation or intervention. Despite the lofty “general AI” scenarios depicted in popular science fiction books and films, the true potential of intelligent automation involves “narrow AI” systems that handle discrete tasks such as pricing products, recognizing fraud, and circumventing customer churn.

Cloud Infrastructure: As Judith Hurwitz of Hurwitz & Associates says in the report, you can't move ahead with intelligent automation without the scalability of cloud. However, not all clouds are created equal. In order to create intelligent information systems, you need an intelligent cloud. Sometimes called second-generation clouds, these advanced offerings include single-tenant, high-performance, bare-metal servers designed for resource-intensive machine learning (ML) workloads. They not only include powerful CPU options, massive memory capabilities, and dense storage capacity—they also incorporate the latest cloud-native tools for building intelligent applications.

Advanced Analytics: There are dozens of routine activities that can be improved with analytics—particularly when those activities involve exploring large data sets and identifying patterns in structured and semi-structured data sources. Whether you are developing an e-commerce website that makes purchase recommendations based on browsing activity or a parking app that broadcasts real-time space availability to motorists, an advanced analytics platform can help by automating data preparation and enrichment activities, recommending new data sets, animating dynamic charts based on real-time query results, and offering instant explanations of key metrics. It's no wonder 71% of the Harvard Business Review Analytic Services respondents reported that advanced analytics will be critical to their businesses over the next five years. IA leaders favor analytic platforms that can help with business scenario modeling, automatically conduct what-if analyses, and offer speech-to-text processing for responding to voice-based queries.

Introducing a Complete Platform for Intelligent Automation

Oracle is hard at work incorporating intelligent automation into every layer of its cloud platform:

- At the application layer, Oracle is infusing IA technology into enterprise resource planning, supply chain management, customer experience, human capital management, and other software-as-a-service (SaaS) apps.
- At the platform layer, Oracle has built-in AI/ML capabilities not only in Oracle Database but also in its analytics applications and management utilities.
- At the infrastructure layer, Oracle uses AI and ML capabilities to keep critical information systems running optimally.

Oracle's intelligent, self-driving systems form a solid foundation for making quick progress with IA initiatives. For example, Oracle Autonomous Database automates patching, backups, tuning, and other routine database tasks, so you can accelerate innovation. Oracle's Gen 2 Cloud Infrastructure enables you to run traditional enterprise apps and modern cloud native apps on the same platform, reducing operational overhead. In addition, Oracle's cloud-native visual development tools make it easy to create IA capabilities, connect systems, map processes, and build modern digital apps—including AI-powered assistants that can carry on natural language conversations.

THE 2025 IMPERATIVE: INTELLIGENT AUTOMATION NOW

Why Delaying Technology Implementation to Improve Business Processes Could Disadvantage Organizations

Intelligent automation (IA) is moving beyond hype and into the mainstream. Enabled by automation, cloud infrastructure, and advanced analytics that include artificial intelligence (AI), virtually every business process and function can be improved through some degree of IA. [SEE SIDEBAR PAGE 2](#) Yet many organizations either aren't moving forward fast enough to keep pace with change, or they're rushing ahead with isolated projects but without a greater plan. In either case, the value companies are getting from IA decreases, and business and technology leaders who don't develop a strategy for enterprise-wide IA will find themselves at a competitive disadvantage.

Information technology (IT) and business leaders must quickly get up to speed on what these technologies can do for their business, develop a strategy that will deliver meaningful value, and define the metrics that will determine their success. Turning strategy into reality at scale will require change across the enterprise—and in many cases, rethinking and transforming the processes, talent, structure, and technology that fuel the business.

If managed well, the effort is worth it. The promise of IA is “a return on investment that's win-win-win,” says J.P. Gownder, vice president and principal analyst at Forrester Research. “It's going to be lower costs, higher revenue, and then some third win, like your customers benefit, you get some kind of quality improvement, or you become more flexible.” Massachusetts Institute of Technology professor and technologist Andrew McAfee believes this transition will happen in the next five years.

Eighty percent of respondents to a recent global survey from Harvard Business Review Analytic Services say it is very important to the success of their organization to employ IA over the next five years. This finding is consistent with results from a similar survey a year ago. The 434 business and technology leaders who took the survey work in a variety of industries, including manufacturing, technology, financial services, retail, and health care. What's more, 86% say they strongly or somewhat agree that not investing in IA would negatively affect their organization's ability to compete.

HIGHLIGHTS

80%

OF SURVEY RESPONDENTS SAY IT IS VERY IMPORTANT TO THE SUCCESS OF THEIR ORGANIZATION TO EMPLOY INTELLIGENT AUTOMATION (IA) OVER THE NEXT FIVE YEARS.

68%

OF IA LEADERS HAVE FORMAL METRICS IN PLACE TO TRACK THE SPECIFIC IMPACT OF INTELLIGENT AUTOMATION ON THEIR KEY BUSINESS GOALS, COMPARED WITH ONLY 27% OF FOLLOWERS AND 16% OF LAGGARDS.

47%

OF SURVEY RESPONDENTS SAY THEIR COMPANY HAS SET UP A GOVERNANCE MODEL FOR THE APPROPRIATE USE OF IA—A SIGNIFICANT INCREASE OVER LAST YEAR'S 17%.

INTELLIGENT AUTOMATION (IA):

Process or workflow automation that incorporates artificial intelligence so the processes can work autonomously and potentially learn and adapt as they go. IA can be applied to most business processes, including industrial systems that sense and adapt based on changing conditions; chatbots that learn from customer engagements to improve how they operate; sales and marketing systems that are able to accurately predict buyer intention and prioritize leads; insurance underwriting systems to approve coverage; IT systems that are self-managing, and more.

Adoption of IA is growing apace. Forty-one percent say their organization employs IA to a significant extent; these are the leaders. Forty-three percent are followers, with just minor implementations of IA. Only 15% say they have little or no IA in their organization, making them laggards.

Intelligent automation is being used in virtually every department in the enterprise, with IT leading the way at 63%. **FIGURE 1** Within those functions and across them, companies are automating three basic things: labor (largely through robotic process automation, or RPA, and different types of AI), systems (through orchestration, APIs, or application programming interfaces, and messaging middleware), and

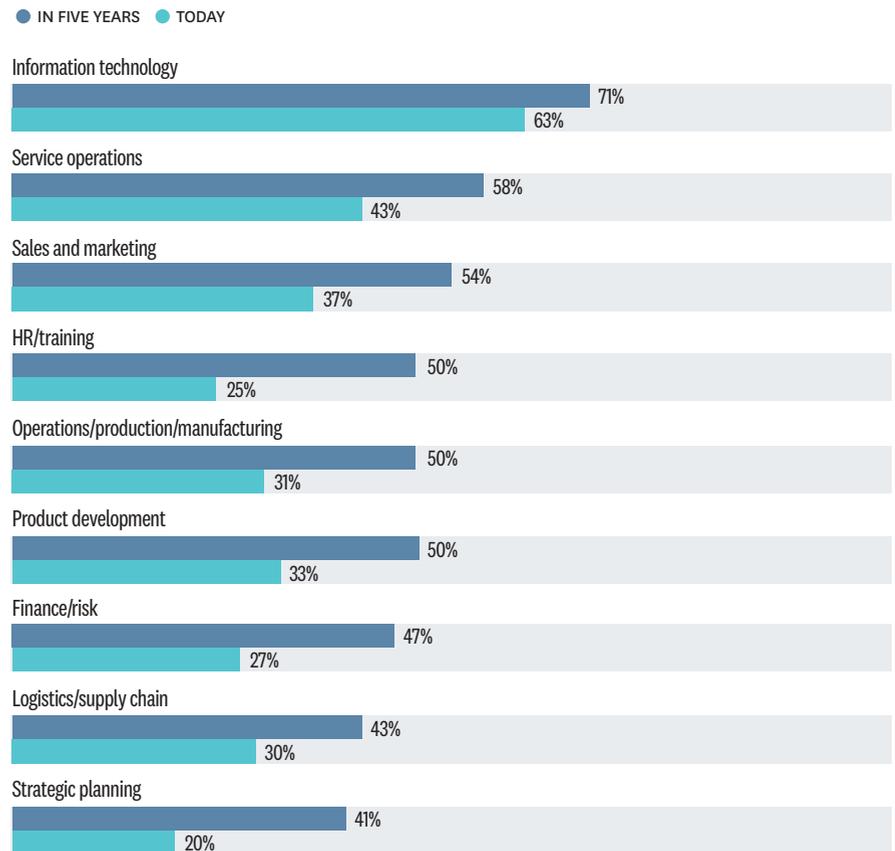
decisions (e.g., using machine learning or business rules to make an automated decision or a recommendation to a human for approval), according to Maureen Fleming, program vice president, intelligent process automation, in the market research and advisory group at IDC. Respondents expect to increase the use of IA in all functions over the next five years.

RPA that incorporates AI to make bots more intelligent is getting a lot of attention because of its promise of increased productivity and its direct impact on jobs. But that's only one form of IA. In IT, for instance, "there's a lot of interest in and demand for automation for things not being supplied by RPA," says

FIGURE 1

IA USE WILL GROW ACROSS FUNCTIONS

The biggest increase in use will be for human resources and training.



SOURCE: HARVARD BUSINESS REVIEW ANALYTIC SERVICES SURVEY, JANUARY 2020

FORTY-ONE PERCENT OF RESPONDENTS SAY THEIR ORGANIZATION EMPLOYS IA TO A SIGNIFICANT EXTENT.

“Automating the fundamentals of infrastructure actually **liberates IT organizations and the businesses they support** to be more agile and innovative. That’s the sweet spot.” —David Schatsky, managing director, Deloitte

David Schatsky, managing director at Deloitte. These demands include cloud and database automation, hybrid cloud management, and automated deployment of new systems capabilities. And technology vendors of all types are incorporating AI into their products—either as enhancements to the core product or as add-on modules available for purchase.

IA is different from automation that is created programmatically, based on assumptions business leaders make about the future of their business, says Judith S. Hurwitz, president and CEO of Hurwitz & Associates and author of *Augmented Intelligence: The Business Power of Human-Machine Collaboration*. IA is directed by data, not hard-coded into the system, making it much more flexible and adaptable to real-time conditions and changes in the business environment.

Survey respondents have high expectations for what IA can do for their organizations. More than half (52%) believe it will have the greatest impact on productivity, naming that a top three expected benefit. But business leaders are looking beyond efficiency when it comes to what IA can do. Around a third named improvements to the customer experience (36%), innovation (35%), profitability (32%), and product/service quality (31%) among their top three expected benefits.

The Multi-Benefit Value Equation

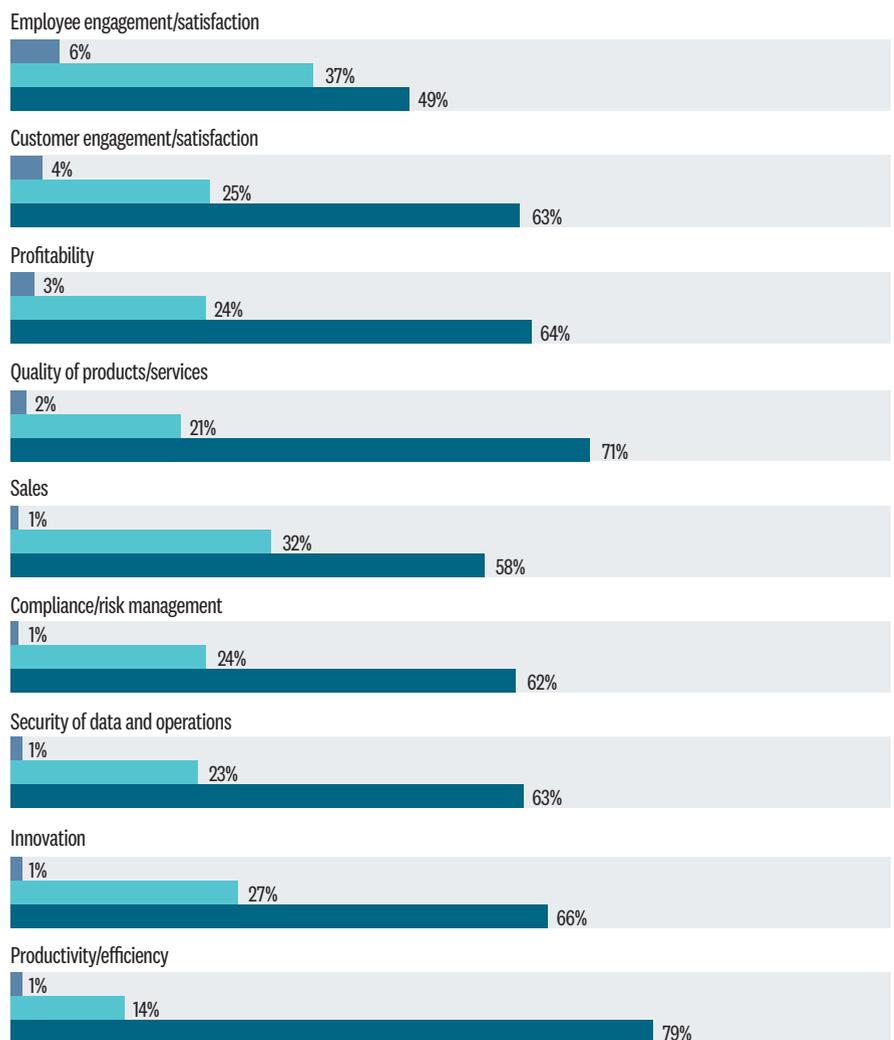
These expectations appear to be justified. IA leaders identified in the survey are seeing positive results from their investments, not just in productivity and efficiency but

FIGURE 2

LEADERS SEE POSITIVE RESULTS

Intelligent automation has increased productivity and efficiency the most.

● DECREASED ● STAYED THE SAME ● INCREASED



SOURCE: HARVARD BUSINESS REVIEW ANALYTIC SERVICES SURVEY, JANUARY 2020

With IA, companies need to pursue maturity on two fronts.

“One is maturity of the technical capability to do wildly useful things. And there’s also the maturity of how enterprises adopt and evaluate what the technology is good for.” —Maureen Fleming, program vice president, intelligent process automation, IDC

also in increased quality, innovation, profitability, customer satisfaction, and more. [FIGURE 2](#) While 50% have also seen improvements in employee engagement and satisfaction, 37% have seen no improvement, and 6% have even seen a decrease, making this an area of potential development for organizations that are concerned about employee retention.

“Organizations faced with labor shortages will focus on improving their labor productivity to reduce the number of people needed to generate an output,” says Fleming. “They have an urgent need to be able to codify, standardize, and automate how that work is performed.”

At the same time, organizations can use IA to retain the talent they need by automating the mundane, repetitive parts of their work—“the things that make you want to cry because it’s so boring, but you have to do it,” Fleming says. The goal in this case is to enable people to “spend their time adding value rather than just filling out paperwork.”

Similarly, companies using IA to improve the experience of customers and grow revenue often reduce costs in the process, according to Forrester’s Gownder. “Most companies want both,” he says.

Traditional, programmed automation, while a boon to productivity, has not been as useful in delivering these other important benefits. And because it’s harder to change, it has given companies less leeway to respond to changing conditions.

“Companies have these dual challenges,” says Deloitte’s Schatsky. “Sometimes

automation and agility are not necessarily best friends because automation entails standardization and regularity, and agility involves change and flexibility.” But these two priorities don’t need to be in conflict, and executives should consider both when making automation investments. For example, “automating the fundamentals of infrastructure actually liberates IT organizations and the businesses they support to be more agile and innovative,” he asserts. “That’s the sweet spot where you can find those two objectives supporting each other.”

Defining the goals that matter is critical in order to establish the right metrics to track results. For instance, organizations whose main concern is productivity will track headcount against output, while those focusing on employee satisfaction and retention will track metrics like employee net promoter scores and retention rates, IDC’s Fleming says.

To get to the right metrics means expanding definitions of value and who is involved—beyond the CFO’s office. “The stuff that is harder to measure is going to be important,” says Gownder. “Building bridges across groups is a success factor in order to do right by employees, do right by customers, and then measure that as a link to growth. Measuring that is not easy.”

IA leaders are making headway here. Sixty-eight percent of IA leaders have formal metrics in place to track the specific impact of intelligent automation on their key business goals. This compares with only 27% of followers and 16% of laggards.

TO GET TO THE RIGHT METRICS MEANS EXPANDING DEFINITIONS OF VALUE AND WHO IS INVOLVED—BEYOND THE CFO’S OFFICE.

The On-Ramp for Enterprise IA

Enterprises' use of intelligent automation is maturing rapidly. Two-thirds of respondents (65%) say their organization has an enterprise strategy for IA, while 24% don't, and 11% don't know. Forty-seven percent say their company has set up a governance model for the appropriate use of IA—a significant increase over last year's 17%.¹ IA leaders are in a distinctly different place, with 91% having an enterprise strategy and 69% having set up governance for IA.

These strategies and governance models appear to be fairly recent developments, as nearly two-thirds (64%) say that past IA projects have been developed in isolation, without an enterprise plan. Additionally, 30% named the lack of an effective enterprise strategy or plan a top three inhibitor of their ability to get value from their IA investments, second only to a lack of alignment and collaboration (41%) among business, data, and IT leaders. The importance of such alignment and collaboration quickly becomes apparent at organizations that treat the use of intelligent automation as an IT or data science project.

“One of the huge mistakes made by some early adopters of artificial intelligence and machine learning was they hired data scientists without creating a team with people who understand the data, the business processes, the strategy,” Hurwitz said. “You have to create this collaboration.”

Indeed, while the technology and data science are important, they're relatively straightforward in comparison to other factors that executives must address.

“Technology mastery and vendor choice are rarely the things that undo you when you're trying to automate at scale,” says Gownder. Executives who want to succeed with IA must address organizational issues like culture change, training for new skills, ownership and governance models for both AI and data, and changing incentives. Those priorities are on top of building the right technology environment and getting the data right.

Fleming looks at IA maturity through two lenses. “One is maturity from the perspective of producing enough technical capability that you can do wildly useful things,” she says. “And there's also the maturity from the perspective of how enterprises adopt and evaluate what the technology is good for.”

Rapid Growth in the Use of AI Ahead

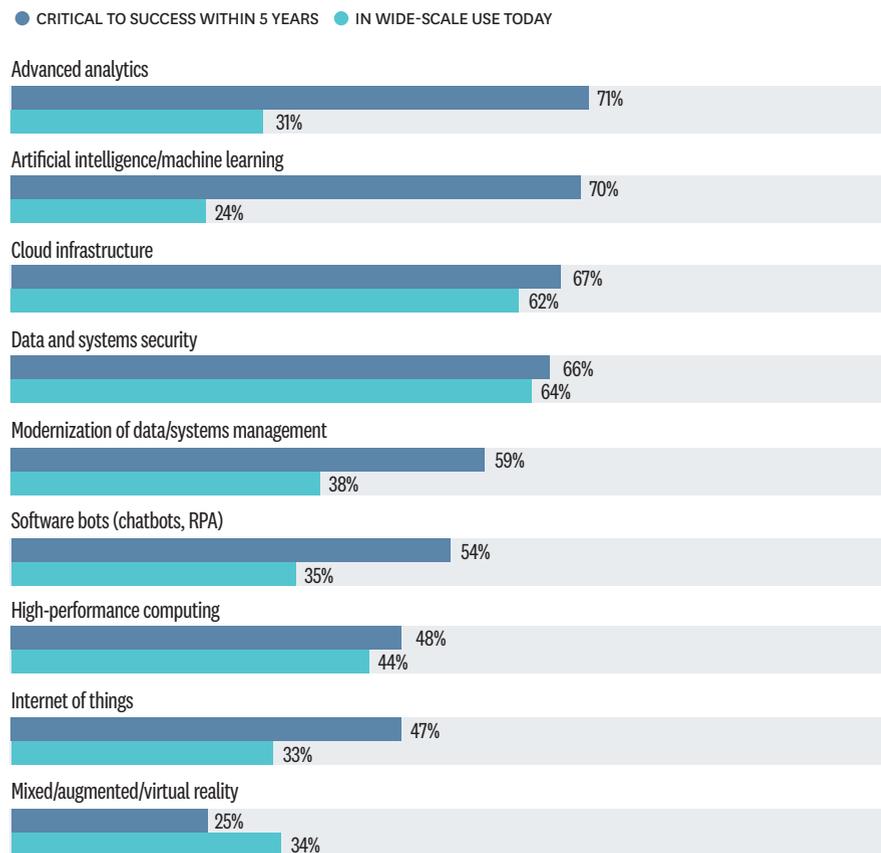
On the technical front, there's a big gap between the degree to which respondents view certain technologies as critical and just how much they've deployed them. **FIGURE 3** For example, while 71% say advanced analytics will be critical to their business over

TWO-THIRDS OF RESPONDENTS (65%) SAY THEIR ORGANIZATION HAS AN ENTERPRISE STRATEGY FOR IA, WHILE 24% DON'T, AND 11% DON'T KNOW.

FIGURE 3

INVESTMENT AHEAD FOR AI AND ADVANCED ANALYTICS

The use of some critical technologies doesn't yet match their importance.



SOURCE: HARVARD BUSINESS REVIEW ANALYTIC SERVICES SURVEY, JANUARY 2020

“Technology mastery and vendor choice **are rarely the things that undo you** when you’re trying to automate at scale.” —J.P. Gownder, vice president and principal analyst, Forrester Research

HOW TO SCALE INTELLIGENT AUTOMATION EFFORTS

While experiments and one-offs can help an organization gain experience with intelligent automation, it’s important to move quickly from isolated efforts to a more comprehensive and strategic approach. Business leaders should:

- Incorporate IA into the business strategy
- Establish an IA “center of excellence” that:
 - Helps business leaders envision new opportunities
 - Sets and disseminates standards and best practices
 - Shares information to help different parts of the organization
- Redefine the metrics that matter to the business, given the new capabilities
- Work with vendors to leverage IA capabilities in enterprise applications
- Provide managers and employees with training and support to be successful

the next five years, only 31% say the technology is in wide-scale production at their organization. The same is true for AI and machine learning, where 70% say it will be critically important but only 24% have it in wide-scale use. Expect to see increasing investment in these areas.

Meanwhile, technologies that are more mature have a much smaller gap. For instance, 67% say cloud infrastructure will be critically important, and 62% already have wide-scale deployments. Similarly, data and systems security are rated critical by 66% of respondents, and 64% say production is wide scale.

Eighty percent of respondents say their organization uses cloud-based platforms for data/analytics—a significant increase over last year’s survey, when only 59% answered yes to this question. Some of that increase can be explained by the fact that there were more IT leaders in this year’s respondent base, but the difference between CIO/CTOs and non-IT leaders was still only 11 percentage points, at 90% and 79%, respectively.

“You can’t do this without the cloud for scalability,” says Hurwitz & Associates’ Hurwitz. “Without the cloud, the costs of compute and storage at this scale are prohibitively expensive. The amount of data can be huge, and when you’re doing massive analytics with models, you might need that power, compute, and storage for a month. You don’t want to have to pay for it after that.”

The easiest point of entry for companies that want to take advantage of IA initially might be to rely on their existing technology partners. “In some cases, AI is becoming a feature rather than a new product,” says Gownder. “Vendors of existing

software solutions are introducing AI technology to make their products better.” This includes RPA vendors offering intelligence modules to augment their bots; ERP, database, and software-as-a-service (SaaS) providers that either integrate intelligence into their existing solutions or provide it as separate offerings; or using IA to create “a more agile, more configurable, and less linear” alternative to traditional business-process management (BPM) environments.

What It Takes to Achieve Scale

Companies that are committed to scaling intelligent automation across their enterprise provide education about what IA is and what it can do, establish standards and guidelines (without being too restrictive), offer training to both IT and non-IT employees, and manage change.

Once an organization gains experience with IA in one part of the business, it can share those lessons from that experience with others. Many organizations are creating centers of excellence (COEs) to promote and propagate the effective use of IA.

Most COEs seek to enable rather than dictate or control what the business can do with IA. They develop standard processes and approaches, “but they also seek to democratize access to the technology and knowledge about it so that they can scale faster,” says Schatsky.

COEs may also provide training materials, help people connect with professional services firms or vendors, provide support to keep systems up and running, and help with building metrics of success, according to Fleming. “It’s a way to standardize,

build skills, and then share skills” across the enterprise.

In the early stages, these groups may operate as SWAT or strike teams, hitting the road to spread their message and help interested business units get started in a way that conforms with basic enterprise standards and compliance requirements.

“Without any standards, it can be hard to manage, hard to scale, hard to ensure compliance, and hard to maintain,” Schatsky says.

Gownder worked with a global company that was running 56 instances of RPA from nine different vendors. “Multi-vendor is fine,” he says, “but do it with intention and a sense of governance and guardrails.”

Because intelligent automation changes the way work gets done, it requires new skills both within IT and in business areas where processes are being automated. These skills need to be developed. More than a quarter of respondents say that a lack of the right skills in the business (26%) and the appropriate technical skills (28%) limits their ability to get meaningful value from their investments in IA, naming it a top three limiter.

Intelligent automation affects “the skills and inclinations of your workforce,” Gownder says. “If I was a financial reconciliation analyst and now I’m being asked to go from doing that job manually to managing bots that are doing a lot of that work, well, my job has changed significantly. I need upskilling and training and support to help me on that journey.”

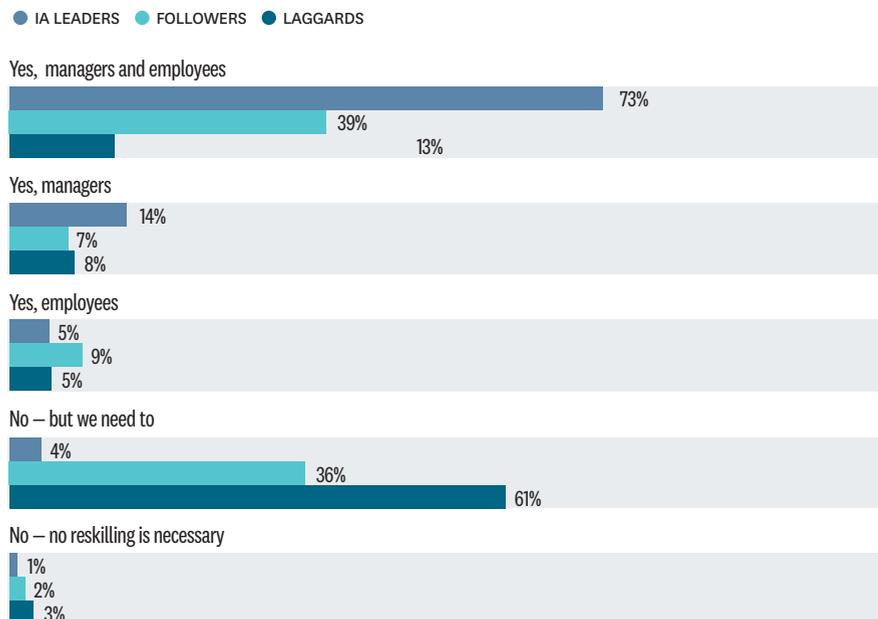
Survey respondents recognize the need for reskilling and say their organizations are stepping up to this work. Almost half (49%) say their company is retraining/reskilling both managers and employees, and another 17% provide such training for one group or the other. An additional 26% say that while this is not happening yet, it needs to.

IA leaders are much more likely to provide training to both managers and workers, at 73%, with another 19% doing so for one of those groups. **FIGURE 4**

FIGURE 4

TRAINING REQUIRED AS JOBS CHANGE

The extent to which respondents are retraining/reskilling managers and employees to work with IA



SOURCE: HARVARD BUSINESS REVIEW ANALYTIC SERVICES SURVEY, JANUARY 2020

For the foreseeable future, intelligent automation will be all about augmentation, not replacement of most jobs, experts say. “You have to augment this sophisticated automated intelligence with human understanding of processes and best practices,” says Hurwitz. “There has to be collaboration between what the machine can do and human understanding.”

In addition to training, companies are putting in place communication and change management programs to help employees through the change process. Half (51%) have such programs in place (76% of IA leaders do), and another 34% say that while they don’t, they need to.

Change won’t happen if old metrics and incentives are left in place, however. “These can be in conflict when the more agile and adaptive and AI-driven insights suggest that some other opportunity is better,” Gownder says, “but that is sticky and hard to change.” He cites the example of call center metrics that historically have focused

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“You have to augment this sophisticated automated intelligence with **human understanding of processes and best practices**. There has to be collaboration between what the machine can do and human understanding.” —Judith Hurwitz, CEO, Hurwitz & Associates

on mean time to resolution. With IA, the “easy” calls are handled by the bot, and only the more nuanced calls, which may require sensitivity or concierge-level service, get to a person. In that case, “you may actually want your mean time to resolution to go up,” he says. The more relevant metric would be for customer experience.

In this case, the organization must move away from the idea that time to resolution should always be low, toward a belief that it should actually go up under certain known circumstances. The challenge is to redefine how success is measured and then put change programs in place to help employees reorient their behavior to the new goals.

Conclusion

Organizations are already reaping the benefits of intelligent automation, beginning but certainly not ending with enhanced productivity. By establishing these proof points, many are now engaged in how to scale their use of IA across and throughout the enterprise.

“You need the scale in order to get a strong return because you want to be able to amortize the cost of acquiring the technology, learning how to use it, deploying it, etc., over a substantial amount of automation success,” Schatsky says.

Front-runners have set up centers of excellence to help business leaders envision where IA can help them, to establish and promulgate standards and best practices, and to share information and help get the rest of the organization up to speed. As work processes change, IA leaders are redefining the metrics that matter to businesses and providing managers and employees alike with the training and support they need in order to be successful.

Businesses with limited resources are leveraging their vendors to bring intelligent automation into their operations rather than growing their own. Even with that support, all businesses have to understand how IA changes the way they work in order to make the most of it.

Automation has helped businesses be more efficient for years. But in today’s world of disruption and transformation, traditional approaches can lock organizations into fixed processes that take too much time and money to change. Business leaders must make sure they balance the dual goals of cost reduction and agility. Intelligent automation is one way to do that, positioning today’s enterprises for an increasingly dynamic and demanding world.

Endnotes

- 1 Harvard Business Review Analytic Services survey, November 2018. Note that the previous survey had significantly fewer respondents from IT leadership, which may affect the comparison of results. That said, there was little difference between responses from CIOs/CTOs and non-IT executives.

METHODOLOGY AND PARTICIPANT PROFILE

A total of 434 respondents drawn from the HBR audience of readers (magazine/ newsletter readers, customers, HBR.org users) completed the survey.

SIZE OF ORGANIZATION

35% 10,000 OR MORE EMPLOYEES	17% 5,000 - 9,999 EMPLOYEES	33% 1,000 - 4,999 EMPLOYEES	15% 500 - 999 EMPLOYEES
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SENIORITY

39% EXECUTIVE MANAGEMENT/ BOARD MEMBERS	33% SENIOR MANAGEMENT	25% MIDDLE MANAGEMENT	2% OTHER GRADES
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KEY INDUSTRY SECTORS

37% TECHNOLOGY	11% MANUFACTURING	8% FINANCIAL SERVICES	7% BUSINESS/ PROFESSIONAL SERVICES	ALL OTHER SECTORS LESS THAN 7% EACH
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JOB FUNCTION

38% IT	13% GENERAL/EXECUTIVE MANAGEMENT	7% ENGINEERING	7% SALES/BUSINESS DEVELOPMENT/ CUSTOMER SERVICE	ALL OTHER FUNCTIONS LESS THAN 7% EACH
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REGIONS

48% NORTH AMERICA	26% EUROPE	19% ASIA/PACIFIC	4% LATIN AMERICA	2% MIDDLE EAST/AFRICA
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Figures may not add up to 100% due to rounding.



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