AI Is Ready For Employees, Not Just Customers

Human-Machine Collaboration Should Start With Employees

by Craig Le Clair
March 27, 2018

Why Read This Report

Your customers aren't the only ones who can benefit from advancing artificial intelligence (AI) support — your employees can, too. Chatbots help employees who service customers, and you can build them with mature AI components. But success requires a focus on tasks rather than job replacement as well as a cyborg-like division between human and machine tasks. This report helps infrastructure and operations (I&O) pros determine which tasks are best executed by people and which are best left to machines, with. use cases describing how that looks.

Key Takeaways

AI Directed At Lifting Employee Performance Is Today's Opportunity
Mature, digitally advanced companies are targeting AI directly at customers, but the majority are also using AI to help their employees excel. Employees deserve conversational tools, too.

Machines Excel At Background Tasks, Not Human-Centered Ones
Machines outperform humans at tasks like navigation and search but stumble at conversations. Today's AI building blocks best suit internal employee support.

Successful Employee Use Cases Mix Machine And Human Tasks
Machines will grab much of the transactional work that humans do today. The result? Redefined roles that emphasize human skills, advice, and counsel.

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by Craig Le Clair
with Glenn O'Donnell, J. P. Gownder, Srividya Sridharan, Ian Jacobs, William McKeon-White,
Rachel Birrell, and Diane Lynch
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Employees Struggle With Advancing Work/Life Complexity

Despite the billions of dollars that enterprises have spent, global employee engagement hasn't improved in the 17 years that Gallup has been keeping track of it.[1] Today, many firms use technologies that actually lower employee experience (EX). And it may get worse — the chaotic workplace your employees face is becoming even more complicated. A maze of legacy systems, a glut of underutilized and poorly integrated apps, the increasing complexity of exceptions, and accelerating training needs all add to the I&O impetus to augment human labor with advancing AI. Today's workforce faces numerous challenges, including:

› **A growing corporate amnesia that will worsen with the "silver tsunami."** Ten thousand Baby Boomers are retiring each day.[2] The population of a small city is closing the door on decades of experience and enterprise knowledge — it's been called the silver tsunami. This progression makes the capture and retention of corporate knowledge an organizational challenge.[3] Overall, intranets, knowledge management, and core systems have failed to deliver on their purpose: connecting people with the information they need when they need it.[4]

› **Not enough time for employees to be human.** Regulation, product, and channel complexity have made employee tasks more complicated. Increased data entry, system navigation, documentation tasks, and transaction detail absorb high percentages of employee bandwidth. Human interaction skills are underutilized.

› **Too much time spent navigating the maze of legacy systems and processes.** Internal employees live by complex rules, particularly in regulated industries such as healthcare and wealth management. Workers now spend up to 30% of their time interacting with dozens of internal systems, knowledge repositories, and reporting apps.[5] Wrestling with cumbersome systems consumes too much human talent.

Firms Still Struggle To Convince Humans To Use Chatbots

Early humans that couldn't distinguish a friend from a foe didn't evolve as rapidly as those that could. To survive, humans had to interact with other humans in advanced ways that are difficult to program into a computer. Humans communicate with each other with verbal and nonverbal nuances that follow complex rules. It should be no surprise that machines stumble at human interaction.

Messaging apps like Facebook Messenger, Kik, and Line, all built less for service than for marketing or experimentation, have driven chatbot adoption.[6] Chatbot success rate for service is low, with some early adopters pulling back.[7] Facebook scaled back AI after chatbots hit a 70% failure rate.[8] Why the high rate of failure? Chatbots aren't sophisticated enough to hold up their end of a social relationship. They can be boring, lose context over time, repeat themselves, or respond to keywords only. Let's face it:

> **The age of the customer doesn't include patience.** In 2016, 40% of typical consumer-facing bot users engaged in just one conversation, and these metrics haven't improved.[9] Major brands indicate that chatbots haven't performed well. Fashion retailer Everlane, one of the first Facebook Messenger partners, is reverting to email. Spring, a conversational commerce pioneer, heard from its customers that its bot was hard to use and lacked the personalization they expect.[10]

> **Customers aren't quite ready.** Today's AI components, when challenged to converse with humans, just aren't ready. Sixty percent of US online adults that Forrester surveyed said they weren't interested in using chatbots to get information or answers from their financial providers.[11]

> **In some cases, the business case is weak.** Most eCommerce digital pros we spoke with in 2017 weren't including AI investments in that year's customer-facing plan.[12] The biggest issue: the lack of a defined business case, according to 42% of business and tech professionals who have no plans or aren't ready to invest in AI for commerce. They prefer to direct AI at service use cases. By contrast, digital firms that combine robotic process automation (RPA) with AI building blocks directed at employees are showing solid business case returns.[13]

Today's AI Excels At Employee Support

Although customer-facing chatbots get the attention, dollars are flowing to AI use cases that make employees more effective: 28% of global data and analytics decision makers who are interested in, planning to implement, or have implemented AI believe that AI could increase worker productivity.[14] AI has the potential to connect activity across channels; understand web, social, and phone presence; route calls and resolve issues more accurately; and allow more genuine human interaction time. Leading brands will use it to support and incentivize human interaction rather than focusing on capturing efficiency cost savings.

Machines Are Far Better Than Humans At Some Tasks

We shouldn't be afraid of machine intelligence — we depend on it more each day. Humans couldn't possibly navigate more efficiently than the worst GPS system. Nor could we memorize the content of millions of websites and surpass the lowliest search engine. For these tasks, machines are a lot smarter than we are and are advancing rapidly to support the workforce.[15] Humans, by contrast, excel at understanding and communicating with other humans (see Figure 1). As a result, we should use machines to:
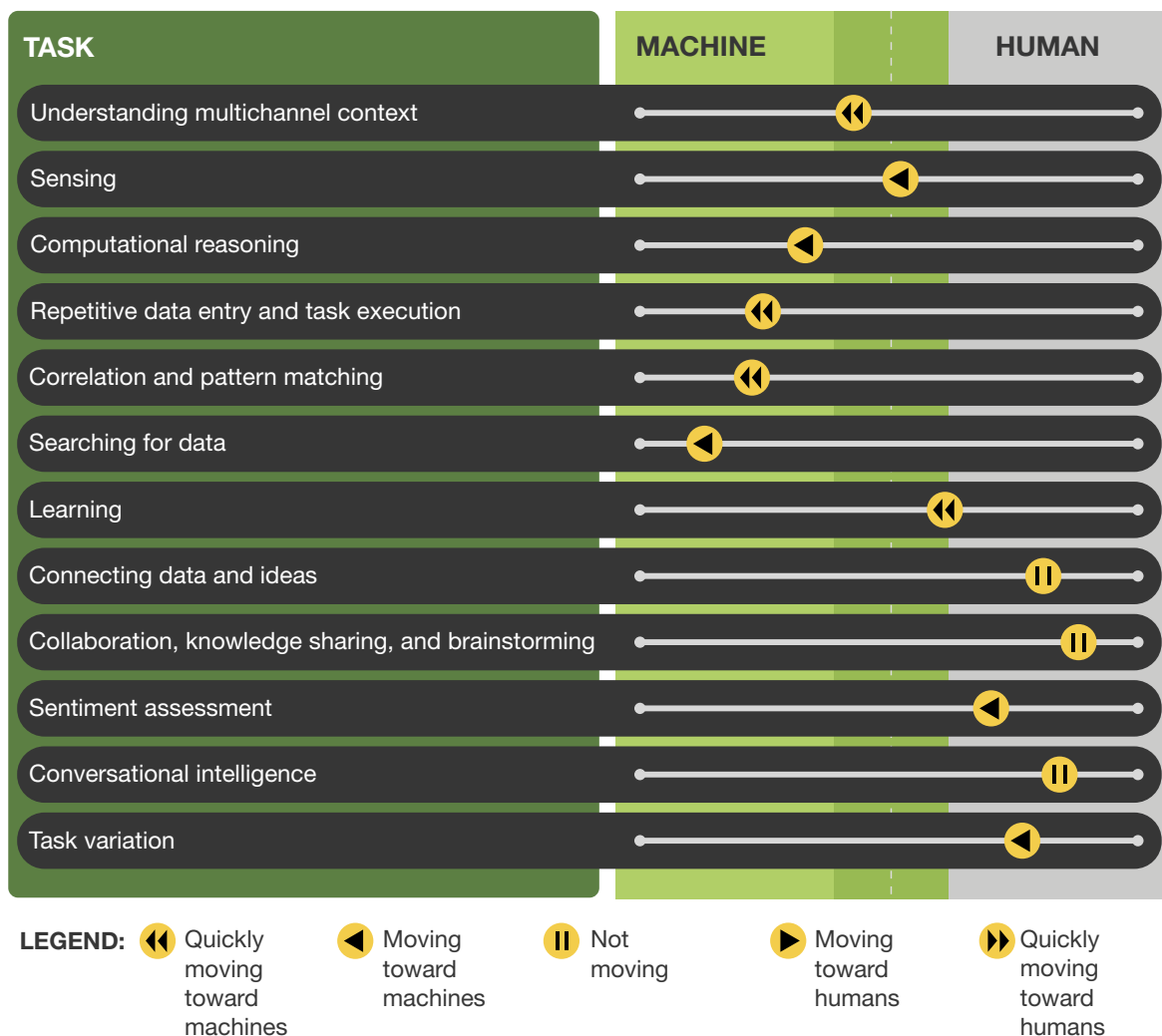
> **Search and optimize information sources.** Machines outperform humans for search, coordinating activity across channels, and computational reasoning. And they have, in many cases, done so for years. What's different today? They make less use of brute force and more use of nuanced algorithms, with vast improvements in computer performance. Bots leveraging data from messaging platforms, unstructured data, and traditional information management provide a new option for capturing and sharing knowledge.[16]

› **Clear out manual processes and eliminate repetitive tasks.** While 55% of business and technology decision makers say that accelerating their digital business is a high or critical priority, only 32% of them are currently working on such an initiative.[17] One reason: Legacy systems clog the arteries of pure digital processes. For example, contact centers leverage interactive voice response (IVR) and NLP automation, yet agents must still pick up a phone and sift through email attachments or access legacy systems.[18] RPA platforms build bots and provide an interface layer to legacy systems.[19]

› **Get the answers we need.** Employees will become more comfortable turning to a machine and asking for help; many already are, outside of work. Using machines for navigation and searching for answers on the internet are now routine. This will translate to the work environment in a significant way over the next three years.

FIGURE 1 Machines Are Becoming More Advanced For Many Tasks

The Financial Services Industry Takes Advantage Of AI To Augment And Aid Workers

Forrester surveyed financial services companies in early 2017.[20] Investments in business-to-employee (B2E) virtual advisors surpassed planned investments in B2C initiatives.[21] These investments found success with:

› **An HR advisor that serves internal employees.** HR's goals have shifted from completing transactions to improving EX. RPA-backed chatbots reduce transaction workloads and focus more attention on talent acquisition, data, analytics, and local job markets. Virtual assistant (VA) chatbots for HR management systems, from specialist providers like Shotways or home-built, will increase in usage.[22] One insurance company built an HR advisor to help employees resolve issues.[23] It combined business rules, machine learning, and a tailored NLP model to resolve queries. Historic data initially built the knowledge base, supported by core data that the company accessed through RPA. According to the leader of this initiative, "The front-office side will take a lot longer to embrace chatbots than the operations side because it's a new channel."

› **A wealth management machine that helps financial advisors (FAs).** You can't have chatbots directly advise customers; they won't meet US Securities and Exchange Commission (SEC) requirements anytime soon. But there's no law preventing an FA from using a chatbot in the background. A large global bank built one to advise FAs on complex tasks, such as retirement rollovers or new account setups.[24] The FA can simply text the bot, "I need to do a disbursement for X, but he also wants to add a beneficiary." The background bot gathers the data, populates the needed forms, and loads them to the client portal. A senior program manager described the breakdown between AI and RPA this way: "The cognitive part of the chatbot handles the conversation, and decisions with the RPA component are used to access back-end systems, particularly where APIs don't exist."

› **A machine to help unlicensed insurance representatives.** One of the largest North American insurance companies had two challenges with its unlicensed contact center reps: 1) Agents were unsure whether compliance would allow them to handle a call and 2) agents turned over, on average, every six months.[25] To cope, the firm built a VA solution. Unlicensed reps now text a machine to ask whether they can take the call and to ask questions. The knowledge base — built with IPSoft's Amelia platform — started with questions based on contact center documents, but the company improved it with call reviews and daily feedback reports. A senior project manager commented: "Constant feedback was essential from users. Involvement of subject-matter experts was unlike other technology projects. Some reps adopted the machine easily, with a sci-fi mindset, but others feared their average call time would suffer. It did not. First-call resolution, on the other hand, turned out to be 2% higher, from 88% to 90%."

› **Emerging use cases for virtual supervisors, specialists, trainers, or agent coaches.** An Australian insurer trained an AI platform to support claim specialists and trained the system with an estimated 10,000 depersonalized claim scenarios with liability determination.[26] The number of customers fast-tracked through the process has tripled. Indeed, leveraging AI to amplify

human intelligence is a growing area. According to Tom Hebner, worldwide head of the cognitive innovation group at Nuance, the need for virtual agents to speak with customers continues to grow; in addition, there's an increased demand for agent and employee support.[27] AI systems supporting employees can have a lower bar than those supporting customers, and Forrester expects to see these use cases accelerate.

Other Industries Also Reveal The Employee Benefits Of AI

Employees need support in almost all job categories and across all industries. Human-machine collaboration can help employees:

› **Cut down on mundane tasks in tech support roles.** The IT help desk consumes human talent. Repetitive support issues drive help desk workers batty, consuming resources that could otherwise drive business innovation. Sweden-based financial group SEB built its first cognitive application for internal support because it wanted to become accustomed to the platform before offering it to customers.[28] SEB combined a chatbot and RPA to reset passwords, unlock Microsoft Active Directory accounts, and point employees to the right IT service solution. "We decided pretty quickly to try it out in our IT service desk," said Mikael Andersson, transformation lead at SEB.

› **Reduce human error rates in medical diagnostics.** Knowledge workers can get help from AI as well. Deep learning, for example, can improve the accuracy of pathological diagnoses for breast cancer. In a series of tests, a pathologist working alone was pitted against one assisted by AI-based machine classification. Deep learning predictions, when supporting the pathologist, achieved a reduction of approximately 85% in the error rate.[29]

› **Search activity logs and provide quick answers to questions.** Niles, a chat assistant that sits in Slack, learns and searches for answers, learns from conversations to connect employees, and captures insights.[30] Any user in a Slack room can ask @Niles simple questions like these: "Who is the account owner?" "What is the standard template size?" If Niles knows the answer, it will deliver it; if not, it will ask for help from the rest of the team. If someone gives Niles an answer, it will remember it. Language processing allows users to ask questions in a less structured manner. Most interactions with Niles happen within Slack to avoid having to switch contexts, but Niles can reach outside to Google Drive and other apps.

› **Dig deeper as investigative reporters.** Major media outlets are developing AI to improve operations. The New York Times uses machine learning to look for patterns in campaign finance data. The Los Angeles Times built a "quake bot" that sends earthquake news updates in Los Angeles.[31] A trending priority is searching for fake news with algorithms that find inconsistencies or dubious references. But AI to personalize, generate, and disseminate content directly to customers is a lesser priority. According to a digital strategy executive at a major media outlet, "In the short term, we see many use cases where AI can help us operate better editorially, searching audio and video social media to help us gather news, for example, but we don't see us using it to disseminate news just yet."[32]

Enhance EX Via Employee-Facing AI Projects

Imagine a machine that works interactively with your workers. Advice, specific instructions, and suggestions — with RPA bots that sweep up routine tasks — help employees in administration, shared service operations, support agents, and contact center workers. This results in lower employee support costs, improve productivity, and free time for building customer relationships. Happy employees lead to happy customers.
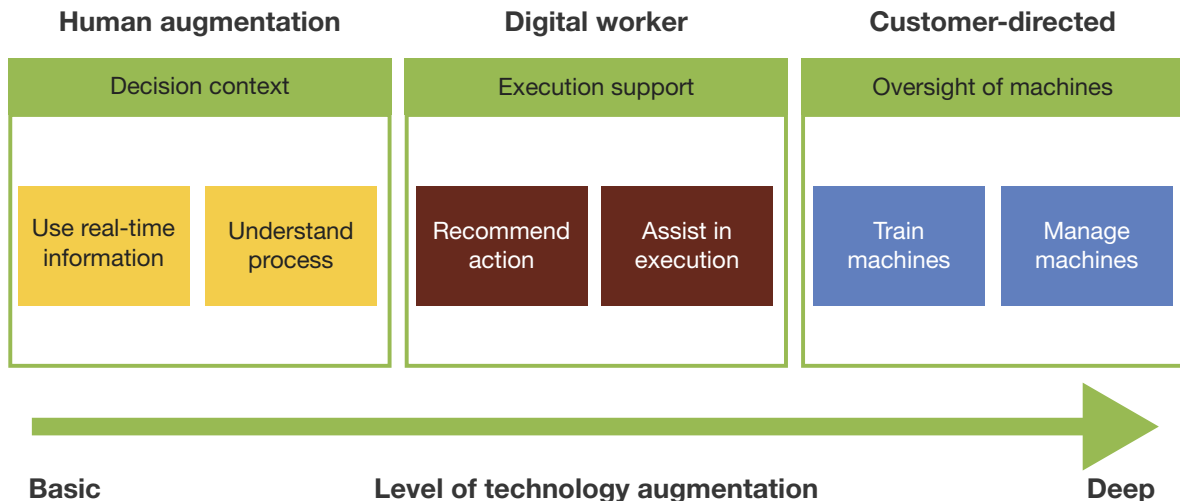
But this automation will augment humans gradually. Over time, machines will improve tasks that workers perform (see Figure 2).[33] As a result, it's best to start AI with employees, move to "digital workers," and then look at customer-directed applications (see Figure 3).

FIGURE 2 Digital Workers Are The Next Stage In AI Development
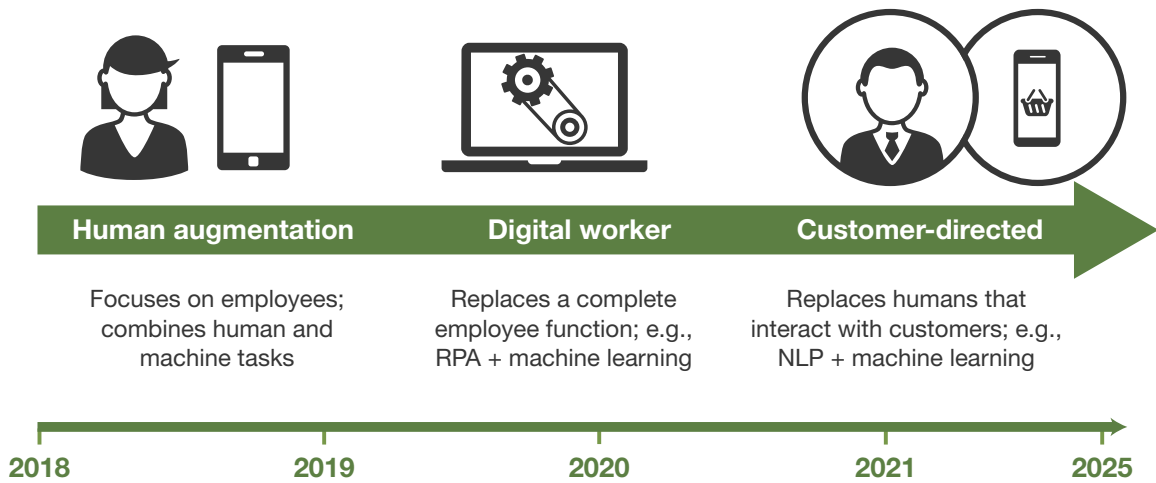
Human augmentation	Digital worker	Customer-directed
Focuses on employees; combines human and machine tasks	Replaces a complete employee function; e.g., RPA + machine learning	Replaces humans that interact with customers; e.g., NLP + machine learning

2018   2019   2020   2021   2025

FIGURE 3 Leverage Preliminary AI Offerings To Augment Your Employees

Combine Human And Machine Tasks To Improve The Employee Experience

In science fiction, a cyborg has a human brain and a mechanized body. Enterprises can embrace the metaphorical cyborg form and split human and machine tasks in a similar way. In general, humans should possess the "head" but give up a good part of the "body" to AI and RPA (see Figure 4). The right combination will:

› **Use humans and machines for what they do best today.** Machines aren't ready to take the lead on human interaction, and customer-facing bots shouldn't attempt tasks that don't fall into their sweet spot. Instead, I&O leaders must separate tasks to maximize the strength of the human mind and what machines do well today. This statement from a senior IT leader at an investment management firm is typical: "We have two proofs of concept (POCs) running today that support internal employees, one for decision support and guidance and one in fraud. We're two years away from having a bot speak to our 'producers.'"[34]

› **Utilize AI components that are ready now.** AI project risk is lower for B2E use cases.[35] Organizations can use conversational chatbots for a specific set of employee tasks that need only the more mature AI building blocks, like machine learning to build predictive models, NLP to analyze interactions, and RPA to execute tasks. Pure AI — intelligence that is nearly indistinguishable from that of humans — is neither essential nor practical today, and many employee interactions don't need it.

› **Target the more tolerant employees.** We often hear statements like this one from a senior architect at a tier 1 personal insurance carrier: "We'll start testing speech-to-text conversion with our customer advisor platform, but not as a first step. We're working with UX architects, with a big emphasis on

customer experience (CX), but we're cautious. We want to test with employees and agents first and only then customers. This way, we can ensure constant feedback from users and subject-matter experts for continual improvement. We find there's too much emphasis on getting this technology to speak to customers."[36] Test with friendly colleagues before releasing AI into the wild.

› **Encourage collaborative behavior when needed.** Exceptions will become so complex that they simply can't be solved by humans or machines working alone. Chatbots for customer service may handle simple commands and tasks, but they don't collaborate well with humans or other bots. Human escalation protocols are crude today. Strong CX will depend on getting machines and humans to work collaboratively.

› **Take advantage of emerging UI trends that suit younger workers.** Drop-downs, search screens, and clever navigations aren't necessary for human/machine employee interactions. In fact, they can get in the way. Millennials simply want to ask a question and get an answer. Crisp text messaging without precise spelling and construction, using NLP and natural language generation (NLG), is the preferred interaction for Millennials. Hint: Older generations may prefer it, too!

FIGURE 4 Celebrate The Cyborg Division Of Labor

The head: human strengths

- Conversational intelligence
- Collaboration
- Connecting ideas
- Sentiment analysis

The body: machine strengths

- Machine learning
- Multichannel context
- Statistical correlation
- Rapid search
- Content analysis
- Risk management
- Repetitive task execution
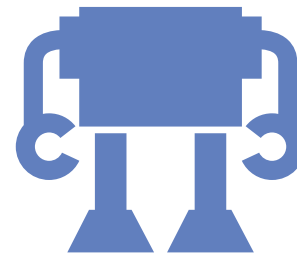
Use AI To Free Up Employee Time And Boost Customer Value, Quality, And Confidence

Observe a five-year-old. A child that age can find 10 ways to build something out of a pile of rocks. Where's this creativity 20 years later? Specialized education and narrow jobs — such as cashiers or invoice approvers — strip out this creativity over time. The cyborg approach lets the machine take the routine tasks and allows humans to do what only they can do. The right combination will:

› **Free humans to plug gaps in institutional knowledge and add customer value.** Automation has chipped away gradually at human tasks performed by full-time employees (FTEs). But few automations have led to upskilling and expanding job scope. Work veterans are more likely to be eliminated than to become knowledge workers, with those remaining still mired in spreadsheets. But focusing AI on employee *support*, rather than *replacement*, can at least slow this trend.

› **Engage employees and raise the quality of their work.** Automation eliminates routine tasks but leaves more complex work in its wake. To tackle these tasks, employees must integrate ideas, source new information, and leverage past learning. Firms that stress innovation to help employees achieve their goals develop a personal connection with their workers. This results in better attitudes and service to customers.[37] The top echelon of employee engagement is called "flow," the mind's ability to engage its most powerful learning mode.[38] Leaders who implement automation that alienates human workers will lose the opportunity for EX to drive better CX.

› **Give employees the confidence they need.** Many jobs are mundane. Routine calls, data entry, report preparation, logs, and documentation often dominate. They tend to be task-oriented and downplay human interaction. Yet the most fulfilling part of the job may be exactly that element: conferring with others, which AI can enhance. For example, once workers in an insurance contact center realized that the virtual assistant wouldn't take their jobs or increase their call-handling time, they found that conferring with the chatbot gave them confidence, made the calls more interesting, and allowed them to address harder or more complicated exceptions. Create an education campaign for internally focused AI projects to show how AI will help workers in their jobs rather than replace them.

Recommendations

Don't Chase The Turing Test — Let Machines Do What They Do Best

The goal of pure AI — also called artificial general intelligence (AGI) — is to make us think the machine is human, and this can be the basis of an impressive demo.[39] But too much focus on the Turing test misses the mark today.[40] I&O professionals don't need AI's potential "human capabilities" to be effective today; they have plenty of humans to work with. It's best to:

› **Look to pragmatic AI to support your human-machine divide.** Forrester identified 10 pragmatic AI building blocks.[41] The most promising today for supporting employees are RPA, NLP, and machine learning models with supervised learning.

› **Restructure jobs rather than replace them.** First, understand the specific tasks that make up a job in total. This allows you to prioritize the lowest-value, most annoying, and most tedious tasks. It also promotes incremental machine support rather than wholesale FTE replacement. This is the best bridge from today's world of employment, one that improves worker attitudes and job performance.

› **Recognize that you control whether machines will be with or against employees.** Most experts agree that the rate of change with AI will be faster than anything we've seen before. This will require a deeper understanding of your people than you may have needed for prior innovations. Use employee surveys to understand what they're thinking. Are they bored? Do they want autonomy, improved work/life balance, or more energy in the organization? If so, emphasize the transformative potential of automation and the promise it holds for EX. Use automation to challenge humans to improve, but don't overlook their humanity. Provide just the right complementary skills, and free them to generate new ideas.

What It Means

Automation And The Future Of Work Will Become The Digital Focus

Mobile and social ushered in the age of the customer. Suddenly, consumers had a new digital way of interacting with the world. Using that power, disruptive companies emerged and gave notice that enterprises must become digital to remain competitive. Digital transformation became a major enterprise goal. But the I&O conversation has now shifted from digitization to the potential of AI and automation. Consider this: Over the next 10 years, automation will eliminate 24.7 million jobs in the US.[42] And enterprises will feel pressure to restructure — according to a Forrester survey, as of 2016, 16% had already done some restructuring, with another 13% planning to do so.[43] But 51% of those we surveyed anticipated that restructuring will occur. Only 20% felt that AI would have no organizational impact. These strong trends will focus leaders on automation frameworks and how well they can use automation to improve employee attitudes, productivity, and work/life balance.

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Supplemental Material

Forrester's Q2 2016 Global State Of Artificial Intelligence Online Survey was fielded in May and June 2016. This online survey included 612 global respondents. For quality assurance, we screened respondents to ensure that they met certain standards in terms of job responsibilities and the size of their organization. The survey defined artificial intelligence for respondents as "a self-learning system that is able to interact with humans naturally, understands the environment, solve problems, and perform tasks that normally require human intelligence, qualities and abilities without the need to code instructions and rules."

Endnotes

[1] Source: "State of the Global Workplace, 2017," Gallup (http://news.gallup.com/reports/220313/state-global-workplace-2017.aspx#aspnetForm) and Annamarie Mann and Jim Harter, "The Worldwide Employee Engagement Crisis," Gallup, January 7, 2016 (http://news.gallup.com/businessjournal/188033/worldwide-employee-engagement-crisis.aspx).

Great employee experience is paramount but elusive. Firms understand that happier employees correlate with happier customers and happier shareholders, yet it's still a struggle to fully engage and support employees. See the Forrester report "The Employee Experience Imperative."

[2] Born between 1946 and 1964, Baby Boomers are heading into retirement (about 10,000 *a day*). Source: Barbara A. Friedberg, "Are We in a Baby Boomer Retirement Crisis?" Investopedia, June 7, 2017 (https://www.investopedia.com/articles/personal-finance/032216/are-we-baby-boomer-retirement-crisis.asp#ixzz55g2PEuf8).

[3] Source: "Preparing for takeoff," HayGroup (http://atrium.haygroup.com/downloads/marketingps/in/Preparing%20 for%20take%20off_executive%20summary_IN.pdf).

[4] Intranets are often poorly designed and leave employees endlessly clicking through documents, unable to locate what they need. Source: Steve Hamrick and Daisy Hernandez, "Your Intranet Probably Sucks - And Here's Why," CMS WiRE, April 4, 2016 (www.cmswire.com/social-business/your-intranet-probably-sucks-and-heres-why/).

[5] Source: Analyst interviews with financial services, insurance, oil and gas, and other $1 billion-plus enterprises.

[6] Developers had created 100,000 chatbots on Facebook Messenger as of April 2017. Source: Tim Peterson, "Facebook Messenger makes chatbots easier to find and use with new Discover tab, Chat Extensions," Marketing Land, April 18, 2017 (https://marketingland.com/facebook-messenger-makes-chatbots-easier-find-use-new-discover-tab-chat-extensions-212172).

[7] Source: Shareen Pathak, "Drop it like it's bot: Brands have cooled on chatbots," Digiday, March 10, 2017 (https://digiday.com/marketing/brand-bot-backlash-begun/).

[8] Source: Andrew Orlowski, "Facebook scales back AI flagship after chatbots hit 70% f-AI-lure rate," The Register, February 22, 2017 (https://www.theregister.co.uk/2017/02/22/facebook_ai_fail/).

[9] Source: Mariya Yao, "5 Metrics Every Chatbot Should Track," TOPBOTS, October 16, 2016 (https://www.topbots.com/5-bot-metrics-every-chatbot-should-track/) and Arte Merritt "Examining the data on chatbot retention," VentureBeat, April 10, 2017 (https://venturebeat.com/2017/04/10/examining-the-data-on-chatbot-retention/).

[10] Source: Shareen Pathak, "Drop it like it's bot: Brands have cooled on chatbots," Digiday, March 10, 2017 (https://digiday.com/marketing/brand-bot-backlash-begun/).

[11] Source: Forrester Data Consumer Technographics® North American Financial Services Benchmark Recontact Survey, Q3 2017 (US).

[12] Forrester interviewed more than 80 industry pros across a mix of 40 vendor and retailer companies at the 2017 NRF Big Show to hear their calls on key tech investments for 2017. Their advice: Focus on tech that creates personal customer connections, reduces pain points along the shopper's journey, and optimizes operational efficiencies. For more on NRF's takeaways, see the Forrester report "The Top Retail Technologies To Watch In 2017."

[13] Forrester recently published a business case assessment of RPA use cases for contact centers and back-office use cases directly supporting internal employees. For more on the state of RPA, see the Forrester report "Inquiry Spotlight: Forrester's RPA Inquiries Reveal Activity But Low Maturity."

[14] Source: Forrester Data Global Business Technographics Data And Analytics Survey, 2017.

[15] Automation technologies — physical robots, software, AI, and customer self-service solutions — are reshaping the workplace and the way your business engages with its customers. I&O leaders and their business and HR partners face the entirely new challenge of implementing and managing a mixed human/machine workforce. For a review of these technologies, see the Forrester report "TechRadar™: Automation Technologies, Robotics, And AI In The Workforce, Q2 2017."

[16] Corporate amnesia encompasses all forms of lost knowledge. Knowledge management solutions have been the historical remedy. Source: Jake Widman, "How to cure 'corporate amnesia' with knowledge management software," Computerworld, June 26, 2017 (https://www.computerworld.com/article/3201304/collaboration/how-to-cure-corporate-amnesia-with-knowledge-management-software.html).

Source: Elka Torpey and Andrew Hogan, "Working in a gig economy," Bureau of Labor Statistics, May 2016 (https://www.bls.gov/careeroutlook/2016/article/what-is-the-gig-economy.htm).

[17] Source: Forrester Data Global Business Technographics Priorities And Journey Survey, 2017.

[18] For an overview of chatbot trends, see the Forrester report "Executive Q&A: Boost Your Chatbot IQ."

[19] For a market forecast for RPA that shows the progress from obtuse RPA to present (intelligent) RPA, see the Forrester report "The RPA Market Will Reach $2.9 Billion By 2021." For a description of pragmatic versus pure AI, see the Forrester report "Artificial Intelligence: What's Possible For Enterprises In 2017."

[20] For a summary of the top use cases for AI in financial services, ranked in terms of investments and CX effect, see the Forrester report "Confusion And Vendor Adolescence Stalls AI Innovation In Financial Services."

[21] Providers are building internal advisor platforms for assistance in research about clients and prospects, to generate advice on complex product/service portfolios, and to help create pipeline quality and raise conversion rates.

[22] Shortways builds digital assistants for CRM, HR, and other specific domains. Source: Shortways (http://shortways.com/).

[23] Source: Analyst-attended briefing by tier 1 insurer, November 2017.

[24] Source: Analyst briefing with a large global bank.

[25] Source: Analyst briefing with a large North American insurance company.

[26] Source: Analyst-attended briefing by large Australian insurer, November 2017.

[27] Source: Thomas Hebner "Creating call center nirvana with the right mix of agent support and smart technology," Nuance, April 30, 2015 (https://whatsnext.nuance.com/customer-experience/future-of-call-center-is-automated/).

[28] Source: "IPsoft's cognitive agent Amelia takes on pioneering role in banking with SEB," IPsoft press release, October 6, 2016 (https://www.ipsoft.com/2016/10/06/ipsofts-cognitive-agent-amelia-takes-on-pioneering-role-in-banking-with-seb/).

[29] The International Symposium on Biomedical Imaging (ISBI) held a grand challenge to evaluate computational systems for the automated detection of metastatic breast cancer in whole slide images of sentinel lymph node biopsies. Source: Dayong Wang, Aditya Khosla, Rishab Gargeya, Humayun Irshad, and Andrew H Beck, "Deep Learning for Identifying Metastatic Breast Cancer," CSAIL MIT, June 18, 2016 (https://people.csail.mit.edu/khosla/papers/arxiv2016_Wang.pdf).

[30] Source: Greg Kumparak, "Niles is a Slack bot that learns your team's questions and answers them so you don't have to," TechCrunch, March 17, 2017 (https://techcrunch.com/2017/03/17/niles-is-a-slack-bot-that-learns-your-teams-questions-and-answers-them-so-you-dont-have-to/).

[31] Source: Max Willens, "The state of AI adoption in media," Digiday, May 31, 2017 (https://digiday.com/media/the-state-of-ai-adoption-in-media/).

[32] Source: Analyst interview with a major cable and satellite television news channel executive, November 2017.

[33] I&O leaders seek to drive productivity, engagement, and success for employees by deploying a wide array of technologies, from traditional devices like PCs, tablets, and smartphones to emerging devices like wearables and smart glasses to powerful new software like AI and intelligent agents. To learn how to successfully augment employees with technologies, see the Forrester report "The Technology-Augmented Employee."

[34] Source: Analyst interview with a leading tier 1 insurance company regarding its AI chatbot internal employee support project.

[35] For more information about how to manage and minimize risk in trying to create successful AI automation projects, see the Forrester report "Tackle Five Key Areas Of Risk For Successful AI Projects."

[36] Source: Analyst briefing with a senior architect at a tier 1 personal insurance carrier.

[37] For more information on how to improve employee experience, see the Forrester report "Redefine Your Workforce Enablement Policy To Empower Employees."

[38] See the Forrester report "Engineer Your Technology Environment To Improve Employee Productivity And Flow."

[39] Most AI solutions have been designed, trained, and optimized to achieve a specific task or set of related tasks. This limits their reusability, increases the amount of data required to train them, and leaves them lacking generality and unable to develop common sense. In contrast, general AI will be able to learn and come up with creative solutions for a range of multidomain tasks. Many see general AI as the ultimate leverage in solving humanity's problems.

[40] Alan Turing developed the Turing test in 1950 to determine a machine's ability to exhibit intelligent behavior that's equivalent to, or indistinguishable from, that of a human. Source: A. M. Turing, "Computing Machinery And Intelligence," UMBC, 1950 (https://www.csee.umbc.edu/courses/471/papers/turing.pdf).

[41] For more on the building blocks of AI, see the Forrester report "Artificial Intelligence: What's Possible For Enterprises in 2017."

[42] For more on the automated and the future of work, see Forrester report "The Future Of Jobs, 2027: Working Side By Side With Robots."

[43] Source: Forrester's Q2 2016 Global State Of Artificial Intelligence Online Survey.

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