The innovation paradox

Where CIOs should aim with AI

Are you an innovation leader?
In a fluid, fast-changing world, how can business leaders drive an innovation agenda that yields real business results?

We set out to answer this question in the Innovation Issue of Workflow Quarterly, which focuses on how companies worldwide are organizing for innovation. We commissioned a global survey to examine how business leaders are using technology to boost innovation and drive business impact across the enterprise.

We also interviewed executives at companies worldwide about how they apply digital innovation to create better products, services, and business models. We asked leaders to rate how effectively their companies use emerging tech to create new products, services, and business models.

Our survey found nearly 60% of global companies are still in the beginning or early implementation stage of innovation maturity. Encouragingly, companies experience a multiplier effect on performance as they climb the innovation maturity curve.

Although only 36% of those surveyed rate AI equally with data and analytics on the list of effective technologies, leaders understand the central role that machine learning, natural language understanding, and predictive analytics play in driving innovation.

We found that innovative companies increasingly use AI to support decision making, operations, cybersecurity, tech support, finance, and risk management.

Overall, our research shows that companies can obtain significant payback from innovation that delivers killer experiences for customers and employees.

Special thanks to my ServiceNow colleagues for their contributions to the Innovation Issue. In particular, I’d like to acknowledge Manisha Arora, director of strategic technology alliances, John Asquith, innovation evangelist, Simon Grice, director of innovation, and Chris Pope, vice president of innovation. Teamwork makes the dream work!

Tell us your thoughts @ServiceNow

Download the research summary: workflow.servicenow.com/quarterly
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Soon after Bill McDermott took the helm at our publisher ServiceNow, he sat down with Dave Wright, the company’s chief innovation officer, to talk about how business leaders can foster innovation. Following are edited excerpts from their conversation.

**Dave Wright:** How do you see the CEO’s role when it comes to innovation?

**Bill McDermott:** Every CEO needs to create a great experience for their employees. There’s a talent war out there, right? Without the great experience, you don’t get the talent. And every customer experience has to create fierce customer loyalty. The math on the net present value of a very satisfied customer is well known by all. But how do you get it done? If it’s not digital, if it’s not frictionless, it doesn’t happen.

**Q&A:**

**Workflow is the big idea**

*A conversation with ServiceNow chief executive Bill McDermott*

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**Dave Wright:** When you’re talking to different customers, everyone has their own idea of what innovation means and how they need to create solutions. What are some of the main innovation challenges facing companies today?

**Bill McDermott:** Everyone needs to speed things up in terms of innovation cycles. In most industries it just takes too long to get the next new product to market. That’s a substantial risk, especially if the old product isn’t selling well enough. And these business models are shifting so quickly. One such model is in our industry. You saw everything go to the cloud, but now being in the cloud is only part of it. Now you have to be mobile, consumer grade and highly secure, always available, always on and totally reliable.

**Dave Wright:** How do you decide what’s a good idea?

**Bill McDermott:** I always try to think about the CEOs we serve. They’re trying to take care of their team and their customers so they can achieve step-function improvements in productivity. What’s their eye on today? What are they trying to do? Then I try to personalize it by the industry, because every industry is a little bit different.

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**Dave Wright:** The beauty of a software platform like ServiceNow is that it has amazing capabilities to go where the customer wants to go. We’ve got the flexibility to build anything and go anywhere. And that’s what innovation is all about.

**Bill McDermott:** Workflow is the big idea, because every executive needs to break down silos and get teams to work in harmony. It’s about taking paper-based processes and digitizing them into a workflow. That’s a $226 billion market just in the United States, $400 billion plus worldwide.

**Dave Wright:** People often assume that innovation sits with an individual, but individuals can’t drive innovation on their own. It’s not a person, it’s not even a team. It’s a culture. You have to get the whole company to think like that. What are the most important steps leaders can take to foster innovation across the company?

**Bill McDermott:** Our whole challenge is to help technology innovators get their ideas into the minds of the business people. So as they create their dreams and their future business models, we’re helping them through the innovation cycle and we’re iterating with them. Design thinking, innovation, prototyping solutions, getting them ready and testing them for the market and then seeing how they work.

The most powerful part of a great company is its culture. A great culture is all about empathy, which starts with listening and feeling the pain or the opportunity in someone else’s world. What our technology can do is almost limitless. So the question is, where do we need to go? We need to go wherever the customer needs to go. In the end the customer alone determines whether we win or lose.
Q&A:
CX innovation at a major communication service provider

A conversation with Comcast’s Luke Hagstrand

At Comcast, creating a seamless, high-quality customer experience is arguably a tougher challenge than delivering broadband services to more than 30 million people. Sweating many of those details falls to Luke Hagstrand, Comcast’s vice president of customer experience personalization. We sat down with Hagstrand to discuss what drives CX innovation at the nation’s largest cable provider.

What’s your process for how you use tech to improve customer experience?
We’ve had a philosophy of experiment, test, and learn before we deploy broadly. With over 30 million customers, we do things at tremendous scale. We can create experiments with AI-driven services where we incubate it first with employees, understand if the experience works or not, then progressively scale it across the user base. That philosophy has been really important.

What’s happening with human agents as the digital experience improves?
We still have humans behind our digital tools. Everyone seems to gravitate to digital experiences today, but what you don’t see is the intelligence behind the scenes we’re feeding to human agents to improve the customer conversation. We have digital tools that will be on 24/7, but there’s just as much emphasis on the human side of the equation.

What element matters most to successful innovation?
I can’t underestimate the impact of culture and the people. If you don’t have the right culture and the right leadership, you don’t attract the right talent. If you don’t have the right talent, you’re not going anywhere. All of those things have to come together.

Progress towards innovation goals
Most companies in our survey (see p. 15) are early in their innovation journey.

Perception gap
Advanced company CIOs give themselves high marks for innovation. Their bosses are more skeptical.

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In the midst of industrywide consolidation and shrinking profit margins, executives at Avnet gathered in mid-2018 to discuss how to brighten the bottom line at one of the world’s largest technology distributors.

In the fiercely competitive electronic components sector, where pricing is volatile and margins thin, even small upticks in financial performance can make a big difference. That led CIO Max Chan and others to pitch a technology solution they’d been thinking about: feeding reams of historical pricing data into machine-learning models to see if they could set optimal prices in something close to real time. If successful, the Avnet team believed the new program would help boost margins when the market was strong and limit losses when the market dipped.

“Instead of selling something for $1, could we price it at $1.20 and still make the sale? Or do we have to drop the price to 90 cents?” says Chan. “That’s what we were hoping to find out.”

The execs gave the plan the go-ahead, and Chan quickly launched a price-targeting trial for Avnet’s European markets. Within a few weeks, the models worked just as hoped. In limited testing, they showed they could improve profit margins by as much 10%.

Getting the technology right was the easy part. Chan’s biggest roadblock was Avnet’s sales team, who didn’t trust the model. They continued to sell components at prices that had worked for them in the past. But Chan kept publishing the results that the system could generate, and eventually the message got through: Salespeople started using the tool, and margins inched up.

Chan’s experiment illustrates one of the major challenges that CIOs face today, as pressures to innovate continue to build. Companies can invest all they want in advanced digital technologies, from predictive analytics to deep learning. But without a host of critical human elements—including support from the CEO—they’re unlikely to see those investments pay off.

That’s one of several takeaways in a new study by ServiceNow and ESI ThoughtLab that explores how effective large enterprises are at using technology to drive innovation. The survey includes responses from CIOs, CEOs, COOs, and other executives at more than 350 organizations in 12 countries and across five major industries.

Other key findings from the survey:

• Few companies have made significant progress toward their innovation goals. Less than 20% of executives surveyed say their company is in the advanced stage of becoming more customer centric (19%), building an innovation culture (17%), improving the employee experience (12%), or reinventing processes (4%).

• Judging from peer reviews, most CIOs aren’t getting the job done. Only 31% of surveyed executives, for example, say their company’s CIO is highly or extremely effective at driving innovation.

To change those perceptions, CIOs need to make sure their organizations are prepared to work in more innovative ways.

That means focusing on more than just technology, says Ari Lightman, professor of digital media and marketing at Carnegie Mellon University. “Without an emphasis on human-centered design, data-oriented cultures, and re-imagining work in terms of how it is allocated, completed and evaluated, innovation will most likely stay in the ideation space and not in execution and widespread adoption,” he says.
Change of this sort requires more than just the CIO, which is why tech leaders need to be in close sync with their CEOs. Together they can help establish a culture of shared responsibility and dispel the myth that innovation is a one-person job.

Meanwhile, CIOs can take steps on their own, such as focusing technology investments in areas where employees are most likely to use new tools, encouraging grassroots innovation within their own teams, and leading company wide pilots that showcase the benefits of new tech.

“We need to wake up each morning and go to bed each night thinking about how to be seen as both the enabler and catalyst of change,” says Lev Gonick, CIO at Arizona State University. Gonick should know: Last year ASU topped U.S. News & World Report’s list of the most innovative schools in America for the fifth consecutive year.

THE CIO PERCEPTION GAP

In 2019, enterprises around the world poured an estimated $1.18 trillion into digital technology initiatives, 18% more than the year before, according to research firm IDC. One major factor driving that growth is fear. CEOs consider the possibility of falling behind with so-called digital transformation—using digital tech to enable new business models and reinvent internal operations—as their top competitive risk today.

The goals of these efforts vary for each company. For some, it’s the ability to make continuous incremental improvements that ultimately create the foundation for large disruption. For others, it’s about using data to develop new products and business models.

Regardless of their focus, the business results of these transformation projects give CEOs more reason to worry. According to McKinsey research, 70% of major digital-transformation projects fail to meet their objectives.

The new ESI/ServiceNow study offers a more nuanced take. Surveyed companies were assigned an innovation “maturity” level based on 10 criteria—ranging from how well they fostered an innovation culture to their success in reinventing processes and improving employee experience. Just 15% of companies qualified as innovation leaders, the highest level in our maturity model. Another 28% ranked as advanced. More than half of all surveyed firms ranked as beginners or intermediate.

What’s holding so many companies back? One answer may be lingering stereotypes about the corporate leaders who are most responsible for implementing new technologies.

“The lore used to be that CIO stood for ‘career is over,”’ says Gonick. “The technology was not mature, and the operational issues were significant. We’ve largely won that battle, but we’ve gotten pigeonholed as people who do only that kind of work.”

Indeed, the ESI/ServiceNow survey shows top executives still consider IT operating challenges to be more of a burden than most CIOs do:

• CIOs are half as likely as other executives to say the need to focus on IT service and support is preventing them from being more effective at innovation.

• Concerns that organizational barriers and conflicting responsibilities hamper CIOs are significantly higher among CEOs than for CIOs themselves.

At the same time, some CIOs may have a distorted view of their contributions to the company’s overall success:

• 46% of CIOs surveyed say they played a major role in increasing the enterprise’s efficiency and reducing its costs. Only 23% of CEOs agree.

• 44% of CIOs say they’ve played a major role in improving corporate risk management and compliance. Only 33% of CEOs feel the same way.

• Nearly 9 in 10 CIOs believe they have a highly or extremely effective working relationship with the boss. Fewer than half of CEOs concur.

The perception gaps, Gonick says, derive from a persistent view of IT as a cost center rather than an innovation hub.
INNOVATION FOR THE PEOPLE

Two years ago, Gordon Dunsford took a new position as chief information and technology officer of the 158-year-old police force in New South Wales, Australia. His mandate was both to revamp the back-office systems that support 23,000 employees and change how officers worked in the field.

Dunsford had an important ally in police Commissioner Mick Fuller, who took over in 2017. Fuller believed the force had a major capability gap around technology. When Fuller hired Dunsford, he made it clear that he wanted “a culture of innovation that would permeate, grow, and change the organization,” Dunsford says.

Creating a culture that embraces innovation is one of the biggest barriers to successful digital transformation. In the ESI/ServiceNow study, no other question surfaced as big a gap between innovation leaders—98% of whom say they’re in the intermediate or advanced stages of building an innovation culture—and all other companies, where only 39% say they’ve reached this point.

Standing in the way of Dunsford joining the leaders: a list of 200 project requests dating back 12 years. Dunsford realized success would require more than just ticking through a list of system upgrades. So he set about trying to gain credibility with rank-and-file employees, who would need to use whatever technology he implemented.

First he took time to understand the day-to-day realities of police work. He went on ride-alongs with officers and even helped execute a search warrant. Then he selected tech tools he thought could make a real difference for the people who would use them.

One of his biggest successes is an app officers use for in-field services. Today, when New South Wales officers need to call in a drug-sniffing K-9 squad or request helicopter air support, they simply pull out their phones and tap in a request on a mobile app. “We call it frontline police service management,” says Dunsford. “It’s completely changed the way our front line and commanders access resources to solve crime or execute events.”

While IT service automation was the initial focus of Dunsford’s innovation project, machine learning is now taking a leading role. Last August, when a knife-wielding man went on a rampage through Sydney’s business district, more than 14,000 clips of his movements were captured by news, phone, and CCTV cameras. Processing all that video and geo-spatial data manually would have taken 60 officers more than a year to complete, says Dunsford. Instead, the department uploaded footage to a cloud-based machine-learning platform, used facial recognition to identify the assailant, and cobbled together a curated account of his actions. Dunsford’s team finished the work in one day. “It’s not just about how to do things more intelligently, but also about how to do it at speed,” he says.

START WITH WHAT YOU CAN CONTROL

Executives in our survey named leadership skills (67%) and strategic thinking and vision (56%) as the most important qualities a CIO needs in order to drive innovation. CEOs value these traits even more: 75% of them prize CIOs who can lead and think strategically.

According to Albert Maasland, Group CEO for 271-year-old Crown Agents Bank: “What I want in a CIO is someone who knows how to play chess, someone who can think through the consequences of the technological decisions we make and see several moves ahead.”

What should CIOs do when their CEO isn’t setting them up for success? They can start by encouraging their own employees to embrace innovation.

Brad Wright leads engineering for Microsoft’s vast internal financial systems, which track revenue, procurement, audits, taxation, and countless other financial functions. Wright tries to foster an innovative culture by continually turning followers into leaders. He’s spent nearly three decades at Microsoft putting this into practice on numerous product and IT teams.

Gordon Dunsford, chief information and technology officer, New South Wales (Australia)
SLOWLY SPREAD YOUR WINGS

Training your teams to take initiative and pursue disruptive ideas is the first step to building an innovation-friendly culture. The next step is finding ways to introduce those innovations into the organization and get them in front of executives who can become allies. A plurality (47%) of executives surveyed by ESI/ServiceNow say uncertain ROI is the biggest barrier preventing the CIO from being more effective at fostering innovation, making it by far the leading hurdle.

At Avnet, Max Chan combats this by launching lots of small proofs of concept, such as his machine-learning-enabled pricing experiment. “In the past, people would blindly buy and implement a new piece of technology, only to find it didn’t add value,” says Chan. The smarter route, he says, is to launch pilots with budgets as small as $30,000. “Many innovations don’t require a large investment up front,” he says. “They can be a six-week program that allows us to prove a particular scenario.” Once trials show success, he explains, Avnet’s investment committee helps build a business case that he can present to company execs.

A smoothly operating tech-innovation pipeline has evolved into a huge asset at Avnet, according to Chan. “We’ve perfected this over the years,” he says. “We make leaders of every individual, not just those at the top,” says Wright. Pushing responsibility and ownership down to every employee, he says, helps Microsoft adjust rapidly to changing situations and make continual improvements. One developer, for example, took it upon himself to fix Microsoft’s clunky old procurement tools. The project wasn’t even on the team’s punch list, but the existing procurement suite resembled “a third-party catalog system with horrible search and organization,” Wright recalls. It required continual outside support and upgrades.

Over the course of a weekend, the developer researched what tools were available in Azure, Microsoft’s cloud computing platform, made the catalog searchable, and created a UI proving the concept. A few weeks later it was ready for production and testing with a target audience. Today, the new procurement system runs without any need for external support. “This was all about his curiosity, his deep ownership of the system, and his desire to make things better,” Wright says.

Still, Wright wasn’t surprised that this developer took the initiative. It’s a move consistent with the culture he’s built within his organization. “I don’t pay my engineers to code, I pay them to think,” Wright adds. “If I want someone to do exactly what I tell them to, I’ll write a statement of work and hire a vendor. But I want my engineers to think about it, get creative, and then solve the best way possible.”

Are you an innovation leader or laggard?

Find out on page 26

FEATURES

Wright says fostering an IT organization where everyone is prepared to innovate is a six-step process:

SET AN EXAMPLE FOR HONESTY AND INTEGRITY. No amount of technical competence or professional achievement will make up for a lack of honesty. If the people around you don’t trust you, it’s game over.

PUT YOUR PEOPLE FIRST. Because people spend more time at work than they do anywhere else, it’s important to make sure they’re taking care of their personal needs, as well as those of the important people in their lives.

ENABLE CREATIVE THINKING. The key to success is allowing employees to come up with their own solutions. Tell them what you’re looking to accomplish and let them figure out the best way to do it.

WORK AND PLAY HARD. Employees are expected to give their best effort at work. But they also need time away from the day-to-day grind, because that’s where new ideas get generated. That’s why in Wright’s org, no one is allowed to skip breaks or lose vacation.

LEARN AND GROW. Making mistakes and learning from them is one of the key steps to innovation.

EMBRACE DIVERSITY. You need a broad range of people, perspectives, and backgrounds to generate new ideas. Without that diversity, you’ll end up recycling the same stale ideas. “We make leaders of every individual, not just those at the top,” says Wright. Pushing responsibility and ownership down to every employee, he says, helps Microsoft adjust rapidly to changing situations and make continual improvements.

Training your teams to take initiative and pursue disruptive ideas is the first step to building an innovation-friendly culture. The next step is finding ways to introduce those innovations into the organization and get them in front of executives who can become allies. A plurality (47%) of executives surveyed by ESI/ServiceNow say uncertain ROI is the biggest barrier preventing the CIO from being more effective at fostering innovation, making it by far the leading hurdle.

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A smoothly operating tech-innovation pipeline has evolved into a huge asset at Avnet, according to Chan. “We’ve perfected this over the years,” he says. But its most valuable benefit, he argues, is a key intangible that gives tech investments their best chance of success. “We have a great relationship with the rest of the C-suite.”

Dan Tynan, former editor-in-chief of Yahoo Tech, is a freelance writer whose work has appeared in more than 70 publications.
When it comes to innovation, Liora Shechter, CIO of Tel Aviv Municipality in Israel, says her priority is helping her city run more efficiently. One such initiative collects reports from residents, municipal employees’ reports, and events from IoT devices to create a real-time map of everything that’s happening in the city.

The data is collected in a dashboard for municipal leaders, making it easier for them to spot disruptions to city services and react quickly. Tel Aviv is just starting to reap these benefits. Meanwhile, Shechter is looking ahead to the next thing: using AI to automate information gathering.

“In the future, we don’t expect the residents to report hazards,” Shechter says. “We expect to identify them as they happen, before the residents know about it.”

Shechter’s confidence in AI is widespread across the C-suite. Eighty-five percent of U.S. CEOs and business leaders are optimistic about AI’s potential, with 82% expecting it to disrupt their business within three years, according to a 2019 survey by consulting firm EY.

For most, the ability to use AI to drive innovation is still in the future. In fact, only 36% of 350 C-suite leaders say AI or machine learning is among the most effective technologies for meeting their organizations’ innovation goals, according to a new survey by ESI ThoughtLab and ServiceNow. That’s less than the proportion who cite data analytics (70%), cloud technologies (67%), mobile technologies (43%), and agile project management (38%)

One cohort is benefiting from AI right now. Among surveyed organizations identified as “innovation leaders,” 58% say AI is one of their most effective technologies—more than any other choice. On the other hand, only 28% of “innovation beginners” cited AI, which trailed eight other technologies.

Executives in the ESI/ServiceNow survey listed more than a dozen current use cases for their AI investments. The most commonly cited areas were:

- Operations (63%)
- Cybersecurity (54%)
- Decision-making (52%)
- Automating technical support (48%)

For companies still working through the early stages of AI adoption, uncertain ROI remains a key stumbling block, says James McKeen, co-author of the book “Driving IT Innovation: A Roadmap for CIOs to Reinvent the Future.” Many less-mature organizations aren’t fully committed. Rather than embracing AI with open arms, they are poking it with a stick to see what happens.

“One CIO recently said to me, ‘If I believed that we could run a profitable business for the next 10 years without spending a dime on AI, I would opt for that future in a heartbeat,’ ” says McKeen. “I just see money being spent and no returns.” So there’s fear and uncertainty.”

For innovation leaders who have gained some comfort with AI tools, the investments appear to be well worth it, even in emerging areas like natural language processing (NLP), which just 9% of executives in the ESI/ServiceNow survey said they were using.

For example, cable provider Comcast embedded NLP into its remote controls so customers can use English or Spanish voice commands to choose shows and channels or to navigate technical issues.

The company has also developed an AI-enhanced assistant that helps resolve customer-support problems. To date, millions of customers have used it across IVR, SMS, mobile apps, Xfinity’s website, and Facebook Messenger.

The chatbot also helps agents resolve problems for customers by gathering data from customer equipment and correlating it with the support call. The company uses that intelligence to troubleshoot issues and identify opportunities for cross- and upselling. If someone is having problems connecting devices to their Wi-Fi network, for example, the AI might prompt the agent to upsell Comcast’s high-end Wi-Fi extenders.

Driving these investments are ambitious customer satisfaction goals. “We have made great strides across the company in customer experience,” says Luke Hagstrønd, Comcast’s vice president of CX personalization. “We’ve got to keep working at this, take risks, make investments.”

Comcast mitigates these risks by starting small, and only deploying AI-based systems once everyone is confident they work.

“We have a philosophy of experiment, test, and learn before we deploy broadly,” says Hagstrønd. “We create experiments with AI-driven services where we incubate them first with employees, understand if the experience works or not, and then progressively scale across our user base.”

— Dan Tynan
How CEOs view innovation

Crown Agents Bank is what you might call old money. The U.K.-based financial services firm traces its roots to the 1740s, when its representatives supervised transfers from the British treasury to overseas colonies. So Crown Agents wasn’t anyone’s idea of an innovation hotbed when a private equity fund acquired it in 2016. The new leadership group was ready to provide a capital infusion, Albert Maasland, group CEO, knew this was his company’s chance to transform itself. The biggest obstacle: “The organization had limited experience implementing new systems,” he says. So he threw himself at it. “The first stage was over-seen largely by me,” Maasland says. By seizing the leadership role instead of delegating it to an inexperienced organization, he was able to “really force it through.”

Many CEOs are obsessed with innovation—and they have to be. They’re under constant pressure to keep their organizations growing while fending off an ever-growing roster of competitors. It’s no surprise, then, that they rank using technology to create new business models and building an innovation culture as top priorities, and why 82% say they’ve started a large-scale digital transformation initiative.

Interviews with CEOs, other executives, and innovation experts show the survey results aren’t so much an indictment of CIOs as they are an indicator of how CEOs view their role. “The real chief innovation officer is the CEO,” says Othman Laraki, CEO at Color, a health technology company. “When I see someone with the title ‘head of innovation,’ it signals to the rest of the organization that it’s not their job to be innovative or embrace change,” says Laraki.

Indeed, the chief information officer—the person nominally in charge of technology—is the executive in charge of innovation at only 17% of companies in the ESI/ServiceNow survey. Much more often (69% of the time), innovation leadership is a shared responsibility.

CULTURE AS THE KEY TO INNOVATION

For Laraki, successful innovation emerges only when people at all levels of the organization think of it as their job. Positioning the CIO as an innovation guru undercuts that message. His belief was put to the test several years ago, when Laraki had a hunch that his engineers might find ways to reduce the cost of one of Color’s key offerings, a genetic test for cancer and cardiovascular disease that required clinical-grade quality and accuracy.

Laraki asked the teams to tackle the problem in small, methodical steps. One of the lab teams totaled up the cost of thousands of micro-procedures involved in genetic risk-screening on a massive spreadsheet, then worked on knocking off a few pennies from each one. By recalibrating hundreds of tiny, liquid-handling robots, engineers found they could decrease the amount of liquid reagent that was wasted in the process, saving 5 cents per test. The group effort ultimately yielded a huge win—a rigorous genetic test available for a fraction of the price of similar tests offered by large diagnostic labs.

“Culture is the single most important factor in fostering innovation,” Laraki says. “People tend to think about innovation with a big ‘I.’ Sometimes what differentiates great products are small incremental ideas that would be hard to do in a high-friction environment, but ultimately add up to a lot. We try to create an environment that allows nascent ideas to find a foothold.”

CIO AS CHESS MASTER

For Maasland, this executive serves as a helpful counterbalance to his own ideas, a trusted partner who understands both the promise and the challenges of a particular technology, and who can guide the C-suite toward the right long-term choices.

“What I want in a CIO is someone who knows how to play chess, someone who can think through the consequences of the decisions we make and see several moves ahead,” says Maasland. Some of the tension between CEOs and CIOs, Maasland says, is healthy. And sometimes a CIO’s direct pushback is invaluable.

For example, Crown Agents thought it could increase revenue by upgrading part of the payments infrastructure in its core banking system. But the CIO pointed out that would make it harder to roll out a planned new product that had an even bigger potential return.

“There will be times when the CIO has to be strong and say, ‘No, this solution will feel good in the short term, but in 18 months’ time the cost and complexity will increase many times over,’” Maasland says. “If you play chess, you’ll understand.” — Dan Tynan
How AI will change government

Party for trust reasons, the public sector has been slow to embrace AI and machine learning. That’s about to change.

BY BOB OSBORN

Machine learning and AI have huge potential to make human decision-making in government vastly more intelligent and efficient—and to automate old, manual processes that bottleneck many public agencies. Problem is, it’s not nearly as easy to be an early adopter in the government setting than it is in our app-driven consumer lives. That’s because decision makers don’t yet have sufficient confidence in the underlying data and machine-generated outputs to trust that they—or the machines—will make the right calls.

Just about everywhere in private industry, machine learning has become a powerful new capability to help businesses make better decisions—whether it’s helping figure out whom to consider for a job, identifying unforeseen cybersecurity threats, replacing critical parts on trains before they fail on the job, or countless other applications.

In the realm of government agencies, however, adoption of machine learning and business process automation is off to a slow start. Many agencies still rely on spreadsheets and paper to manage key functions. Some agencies are still using 1990s technologies or lack the funding to make upgrades. Others may have the right kind of IT architecture in place but lack the ability or tools to organize and normalize the massive data volumes you need to train machine learning models.

Leadership factors in, too. Most government workers are eager to give AI and machine learning a test drive. Yet in a recent Accenture survey of public sector employees, 75% say their bosses haven’t yet explained how AI applications will change their jobs. The biggest roadblock to AI adoption in government is trust, especially when it comes to using machine learning algorithms to guide decision making. Public agencies approach this idea very differently than, say, a consumer asking Siri for directions to a restaurant. For starters, some types of decisions in public agencies are strictly reserved for humans. For legal reasons, we can’t hand them off to machines even if that were possible. For example, only a federally sworn official can approve a contract for any good or service that obligates the government to spend public funds.

Trust Matrix

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<th>Trust</th>
<th>Value</th>
<th>Confidence</th>
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Each element influences the others:

The higher the risk of making the wrong decision, the higher the confidence level must be in the underlying data used to make the decision. The level of urgency around the decision balances or competes with the level of risk. So in decisions that involve high risk but also high urgency, the urgency may force decision makers to accept a lower confidence level in the information. Alternatively, risk concerns may trump urgency, leading decision makers to go with the seemingly safer choice.

All these factors are in play when you’re stuck in traffic and running late for a meeting—and you pull up Waze on your phone and see a detour that promises on-time arrival. You’re dealing with considerable risk (possibly arriving even later if you commit to the detour), high urgency (the meeting starts in 15 minutes), and perhaps a medium level of confidence (you remember the time Waze left you lost on a fire trail). Most consumers don’t let these concerns stop them from using Waze and similar apps. Government managers, on the other hand, tend to obsess about them. While the mass adoption of virtual assistants in government is still a ways off, there are many use cases emerging for machine learning in government, where machines can help manage trust dynamics and allow people to make better decisions more efficiently.

EMERGING POTENTIAL

At the National Oceanic and Atmospheric Administration, engineers are using deep learning techniques to train computers to identify hurricanes from an overwhelming volume of weather and satellite data, and to make predictive forecasts about how they will behave before and after they land.

Military readiness is another promising use case for AI. Before units are deployed to support a given operation, they must attain specific levels of readiness. Determining readiness takes into account a multitude of factors, from individual health and training to equipment readiness and the number of vehicles that are online or still in the maintenance shop.

Unit readiness reports are still generated manually today, which makes it difficult for U.S. Department of Defense leaders to know in real time what the readiness level is of all the units across the entire military. That’s a job an AI can handle well, since it’s got all this data all the time and can analyze the complex questions involved, such as: What is the right amount of time for which type of deployment? When units return, how long will it take to get

IT TRANSFORMATION

Risk, urgency, and confidence are the key variables that create trust in technology to support a human decision.

Machine learning and AI also have big potential in the federal budgeting process. Federal agencies are required to forecast their expenses five years—a process managed by the Office of Management and Budget. Most of this forecasting is done manually, but all of that calculations could be run through a machine learning algorithm—by program, by agency, and by legislation—to give government CFOs a holistic view of program costs versus incoming revenue. Massive amounts of waste can be eliminated if agencies begin to make this shift.

Getting public agencies on board with machine learning won’t happen overnight. The good news is that it won’t take huge capital investments to make it happen, and most of the data required is already available.

All it takes is trust. But even there, the metrics are promising. While there is clearly some risk involved, the urgency level rises every day. And the early success of these technologies in the private sector gives government decision makers the confidence they need to dive in.

Bob Osborn is chief technology officer (federal) at ServiceNow.
How to identify your company’s secret influencers

BY HOWARD RABINOWITZ

Your company’s org chart tells only half the story.

While org charts show basic hierarchy, they don’t show that the executives atop the chain of command aren’t necessarily the most influential people inside a company.

That’s because daily interactions among workers—not job titles or decision-making authority—are the key determinants of real influence, according to organizational design experts. Who shares knowledge within (and between) teams? Who greases the wheels of productivity?

The science doesn’t just identify who’s communicating and collaborating with whom. It also pinpoints workers who boost the productivity of others.

One multinational company hired Humanyze to analyze productivity gaps among engineers. Data showed that a small group of influencers played a big role in getting projects across the finish line. Team members who collaborated with influencers were 60% more productive than those who did not. That efficiency boost helped drive down project completion times for the entire team.

Armed with those insights, the company restructured teams and scheduled more time for knowledge sharing between influencers and junior employees. The influencer analysis ultimately generated $22 million in increased revenue, according to Humanyze.

The concept of network analysis dates back to the 1950s, when sociologists first used it to study how informal communities function. In the early 2000s, companies began using ONA methodology to improve organizational design. Its scale was limited, however, because ONA analysts only had access to survey data.

Today, companies have a wealth of analytic tools to help them understand internal influence networks. They can pull data from email, instant messaging, and collaboration apps; from project management platforms, work calendars, and social media. Even employee badges can be part of the mix: Humanyze uses “smart ID badges” for a view into how people move about the office each day and whom they interact with the most.

These data streams would be useless without the processing power to mine them on a large scale, says Rob Cross, professor of global leadership at Babson College and a co-author of the UVA study. “The science doesn’t just identify who is communicating and collaborating with whom. It also pinpoints workers who boost the productivity of others.”

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Another benefit of identifying influencers is the ability to pinpoint workers who are adept at promoting cultural change. Top executives and managers often have limited ability to promote grassroots change.

"Before, when we'd get the leaders on board, we were able to change about 10% of a company's behavior," says Tiffany McDowell, principal of human capital at Deloitte. "Now, knowing the influencers, we're able to change 80% or 90% of the company's behavior."

Influencers can help drive cultural change for a variety of objectives, from promoting HR policies and digital transformation initiatives to major restructuring and merger integrations.

There's a cautionary flip-side scenario, however: Positive influencers can become negative ones if they're unhappy on the job. Deloitte recently identified 1,000 managers who influenced a 3,000-person IT division of a large tech company. Its analytics revealed that influencers' engagement scores were 30% lower than those of their colleagues. They didn't feel like the company took care of them, that their ideas were heard, or that they had a say in the direction of the business.

"That's a major risk, because all of your business value is tied to those folks," McDowell says. "But they're walking the halls every day proliferating a 'you're on my radar' mentality." The company immediately took steps to make these key players happier and more engaged, by redesigning roles and offering incentives.

**Influencer Burnout**

Because of their reputation as connectors and knowledge-sharers, influencers are vulnerable to another hidden danger: burnout.

"These people are helping connect people in different parts of the organization. If you're giving them too much to do, that can lead to very bad outcomes," says Humanyze's Waber.

Cross' research team at Babson College recently analyzed how executives worked in the production division of a major petrochemical company. They shifted ownership of some tasks to influencers and knowledge-sharers, influencers, they shouldn't undervalue every-one else.

"There's a knee-jerk reaction that being on the fringe of the network is bad," says Cross. "There are many reasons why a high-end scientist, for example, is engaged in solitary work that adds value to the enterprise."

Peripheral players, in fact, may represent just as much untapped value as influencers. As employees rise through the ranks, they often find themselves at a distance from day-to-day operations. By identifying them, companies can pull them into projects where their expertise can add value.

Put another way: Many of your outliers today can develop into power brokers. But companies will never know who they are if they don't know how to look. 

Howard Rubinowitz is a business and technology writer based in West Palm Beach, Fla.

**Wanted: CIO leadership**

Executives rate leadership and strategic thinking as key CIO attributes

<table>
<thead>
<tr>
<th>Leadership Skills</th>
<th>In-depth knowledge of latest technology</th>
<th>Building high-performance talent</th>
<th>Knowledge of the business</th>
</tr>
</thead>
<tbody>
<tr>
<td>48%</td>
<td>39%</td>
<td>38%</td>
<td>47%</td>
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**Companies can also use ONA tools to capture critical knowledge before it leaves the building. TrustSphere, for example, analyzes employee data to produce a Knowledge of the business score.**

The company's analysis revealed that influencers and influencers' peers were more engaged, by redesigning roles and offering incentives.

**Best examples of human-machine teaming**

Enterprise tech leaders weigh in on how people can partner most productively with AIs, bots, and algorithms.

While just 5% of all current jobs are likely to be fully automated in the years to come, 50% of all work activities today could be offloaded to machines, according to McKinsey research. What does that mean? People will work side-by-side with a wide variety of intelligent digital tools to augment their work.

Human-machine teams are in the horizon, but what does that look like in practice across different industries? In this expert roundtable, we asked four leaders in digital innovation where they see the most promise with human-machine collaboration.

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**Enterprise tech leaders weigh in on how people can partner most productively with AIs, bots, and algorithms.**

**RUNDOWN**

**Human agents with digital superpowers**

I watched a demonstration a couple years ago showing how a human/AI interface could work. A call was coming into a customer support center. While the agent was logging the call, NLP technology was processing the call in real time and using NLU to understand the conversation on the phone. When the caller explained the problem, AI would ask if a human/AI interface would be able to handle it. The agent would ask the agent to ask the model.

When the caller replied with the model, the assistant popped up on the screen. The assistant identified six issues with that device, right in front of the assistant. The agent instantly had all the answers at their fingertips. The caller felt like they were speaking to a true expert in the issue that was causing them frustration. The AI was being used to augment, not replace, the agent.

**Want to learn more?**

Quiz:  
Are you an innovation leader?  
See how your organization stacks up.

The benefits of innovation aren’t distributed evenly. Instead, they accrue disproportionately to the most innovative companies. That’s one of the key findings of a new study by ESI ThoughtLab and ServiceNow, which surveyed more than 350 executives in 12 countries. The study found execs at “innovation leaders”—organizations that represent the top 15% of companies—say their return on tech investments to spur innovation is over six times higher than the 26% of innovation beginners, companies who are just starting to invest in innovation. The differences don’t stop there. Innovation leaders are more likely to benefit from artificial intelligence (AI). They have an easier time controlling technology costs. Finally, their senior leaders are far more likely to rate the CIO as highly or extremely effective, compared with just 24% of all other companies. In particular, they lead the pack in using AI to aid decision making, and they’re more likely to make effective use of IoT, collaboration platforms, and 5G.

Executives at innovation leaders are also more likely to credit their companies’ CIO for the gains. Sixty-five percent grade their CIO as highly or extremely effective, compared with just 24% of all other companies.

Leaders are also the first to realize the benefits of AI, with 58% of leaders ranking it among technologies most effective at meeting innovation needs, compared with 33% of all other companies. In particular, they lead the pack in using AI to aid decision making, and they’re more likely to make effective use of IoT, collaboration platforms, and 5G.

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Advancers list data and analytics (74%) and cloud (71%) as the technologies most effective at meeting their companies’ innovation goals. Only 35% put AI in this category. Forty-four percent of executives at advancers say their CIO is highly or extremely effective compared with 27% of all other companies. They list uncertain ROI (53%) and cybersecurity risks (47%) as the main barriers preventing the CIO from being a more effective innovation leader.

Innovation leaders are already reaping the benefits of their technology investments, with revenue gains from innovation far outsizing the costs. Leaders are more likely to report major improvement across a range of disciplines as a result of their efforts. Among the areas where leaders see outsized impact:

- 40% report major improvements using technology to become more customer-centric compared with 16% of all other companies.
- 64% claim major improvements in data-driven innovation compared with 27% of all other companies.
- 25% say they’ve made major improvements to their employees’ experiences compared with just 8% of all other companies.

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Lessons from Australia’s top tech cop

Q&A with Gordon Dunsford, CIO of New South Wales Police

When he took over as CIO of New South Wales Police in 2018, Gordon Dunsford looked past the conventions of the job title. He viewed the challenge—to bring an antiquated IT organization supporting 23,000 employees into the 21st century—more like a CEO. In his view, he was building a new business, not just revamping part of an old one. Dunsford shared some of his insights with Workflow Quarterly.

What was the organization like when you took over?

We were a traditional IT shop with mainframes and Lotus Notes. Today, we’re well on our way off the mainframes and we’re doing a lot around citizen engagement. We built a community portal where you can report crime online, including through dash cameras and home CCTV. And we’re doing a lot with machine learning so detectives can get faster results.

How about the culture?

The initial perception was that IT was the dark side: “Just give them the finance and HR systems to look after.” But our new commissioner wanted a culture of innovation to grow and change the organization, and get everybody to stop thinking about what they’d been doing for the last 30 years. I was asked to lead the charge, put the business case together, work across government for what we’re going to do with firearms, Tasers, and other things IoT. Now our people are coming to us first—instead of a consulting company—to drive what, how, and when we innovate.

What do you see as your biggest priorities as CIO?

If you’re a new CIO, it’s important to get the right operating model, partners, and platforms and to invest in digital infrastructure to support your business needs at speed. You also need a great architectural team to identify which capabilities and workflows should run on particular platforms and make sure that they fit the purpose. Successful CIOs aren’t technocrats. They’re executives who need to manage expectations, find funding sources, turn bad funding decisions into good ones, recycle cash into the right spaces. You’re managing a business, not IT.
Transform the IT experience

Transform your IT value chain, from planning to operations. Drive innovation on a single cloud platform. Ensure better alignment with business priorities. Deliver modern, AI-powered user experience.