AI and the World of Work:

EMBRACING THE PROMISES AND REALITIES

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AI and the World of Work: Embracing the Promises and Realities

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INTRODUCTION

A truck with no driver travels 120 miles to deliver a shipment of beer in Colorado.[1] The quintessential 21st-century taxi service experiments with driverless cars.[2] A traditional adversary to brick-and-mortar plans a real grocery store with no checkout line.[3] A major investment bank replaces managers with automated stock pickers.[4] ***A word to the wise: artificial intelligence (AI) is no longer artificial. It is now very real.***

More than 70 years after its initial appearance, AI has made the leap from theoretical promise to practical reality. Machines can now perform human activities that were considered fantasy as recently as a decade ago. At the same time, AI has given rise to the worst science-fiction fears of the "Terminator" machine — an independently thinking robot that dominates and destroys humankind.

Clearly, the level of drama in modern commentary about AI is high, but somewhere between the promise, the skepticism, and the threat is the reality of AI today. It's a reality that business leaders, workforce strategists, and talent decision makers can no longer afford to ignore.

Gaining a Business Perspective

AI is displacing old jobs and creating new ones, and it is reshaping how companies compete for talent and get work done. From setting strategic priorities to adopting technology and evolving the workforce, some of the most important drivers of business success will be influenced by the continuing innovations in AI.

So, what does AI really mean to the future of business, work, and talent? It is a complicated topic, so Allegis Group set out to provide a framework that focuses on understanding the state of the technology today, its impact on jobs, and its impact on talent management.

THE STATE OF AI

Many talent and business decision makers do not fully recognize how AI-driven innovations are influencing the world. AI is taking over real jobs from production and knowledge workers alike. It is also playing a role in the evolution of talent management, touching everything from sourcing and recruiting to candidate care and employee engagement.

From its infancy in 1940s academic research to the current world of digitalization and robust applications, AI has made significant progress. Historically, nearly every advance in AI was met with some setback that would stall its development for years. Today, this start-and-stop cycle has been finally broken as new applications of AI are being brought to market faster than ever. As a result, AI is more than a promise for the future; it is now in use for many applications across many industries.

IMPACT ON JOBS

While rapid development and adoption of AI marks a positive step forward, new developments are also giving rise to concerns about AI's influence on the workforce. One of the most talked about concerns is that smart machines are taking jobs away from people. It is true that the technology is taking on many skills formerly attributed to humans, but AI is also creating demand for new skills.[5]

For workforce and talent planners, this evolution means an open mind, and extreme agility will be essential to success. AI is creating demands for specialized engineering and programming skills, many of which did not exist in the recent past. In the future, value-creation and creativity, rather than an ability to manage a rote process, will increasingly determine the type of workers that are in high demand.

IMPACT ON HR AND TALENT

Finally, AI is on a path to change the rules for how companies attract, engage, and retain talent. It offers an opportunity to improve how employers define job requirements. It can analyze and learn from large data sets to achieve a nearly intuitive ability to match requirements to ideal candidates. And it can facilitate candidate and employee engagement in ways that were not possible in the past.

AI will not replace the need for talent professionals; instead, it will change the nature of what they need to do to succeed. For those who lead and execute talent strategy, gaining an understanding of the forces of change is the first step in rising to the new demands of an AI-enabled workplace.

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For business leaders, a practical view of AI begins with a deeper look at the three key areas of understanding: the state of AI today, its impact on jobs, and its impact on talent management. Put in context, AI is more than a great story or sci-fi topic; it is part of the real business landscape today, and it is shaping the way companies compete for talent in the future.


THE STATE OF AI:
We're Not in
Kansas
Anymore

STILL THINK OF AI AS SCIENCE FICTION? THINK AGAIN.[6]

"Voice assistant software is the #1 AI app today."

In a recent survey, 32% of corporate executives cited Siri (Apple), Google Assistant, and Alexa (Amazon) as the top AI tech in their workplace.

"AI bots will power 85% of customer service interactions by 2020."

Gartner research predicts that AI will support 85% of customer service by 2020.

"Digital assistants will 'know you' by 2018."

Gartner also predicts that digital customer assistants will develop quickly to converse with humans, understanding context, history, timing, and tone as soon as 2018.

"20% of business content will come from AI by 2018."

According to Gartner, 20% of business content will be written by AI software in the near future. Affected communications will include legal, marketing, and financial documents, as well as press releases, articles, and white papers.

"Get excited for self-driving cars."

Global management consulting firm McKinsey predicts 300,000 lives will be saved in the coming decade by self-driving cars that reduce fatal accidents. Autonomous vehicles will also save $190 billion annually in critical care costs and save users up to 50 minutes per day by freeing up driving time to focus on other tasks.

"AI drives a $14 trillion to $33 trillion economic impact."

Bank of America predicts AI will fuel growth and cost reduction that generates $14-$33 trillion annually.

"Machines will be smarter than us by 2029."

Ray Kurzweil, director of engineering at Google parent company Alphabet, predicts machines will be smarter than humans by 2029. This milestone, just over a decade away, is likely to cause significant social changes.

Innovation Comes of Age

AI surrounds us. Nearly every mobile device has a function designed to hear and answer a question, whether that question begins with, "Hey Siri," "Hi Cortana," or "Alexa," AI is being used for sales lead qualification, pre-selecting job applicants for interviews, driving Facebook advertising, determining Netflix recommendations, monitoring credit card accounts, and informing healthcare planning decisions. These examples only touch the surface of the AI story today.

After nearly 70 years of academic research and development, AI is finally coming of age. The hype about its promise is tremendous, and the investments are very real. AI has already penetrated its way into the lives of millions of people around the world. In short, when it comes to AI innovation and adoption, the global business environment is very different than it was just a decade ago.

AN ELUSIVE DEFINITION: THE "AI EFFECT"

How will AI impact the way we approach talent and business in the future? The answer will be shaped by an evolving definition and expectations of the technology, pushed by the forces that drove it to its current state. With that in mind, what does AI mean?

A Stanford University study defines AI as, "the use of machine intelligence and software tools to perform human tasks with the goal of achieving human parity."[7] The definition works, but there's a catch. The types of technologies and solutions referred to as "artificial intelligence" change regularly as technology evolves. As AI brings new technology into use, users become accustomed to the technology, and it stops being considered AI. For example, many solutions referred to as AI today are more closely identified by experts to be data analytics and not real AI. This tendency for the definition of what *is* or *is not* AI to evolve is known as the "AI Effect."

THE AI Effect:

Users become accustomed to [technology], and it stops being considered AI. …This ***tendency for the definition of what is or is not AI to evolve*** *is known as the "AI Effect."*

A QUICK LOOK UNDER THE HOOD

The distinguishing characteristic of AI technology is its ability to learn. According to a report by Talent Tech Labs, an HR tech incubator and Allegis Group's innovation partner, "To be true AI, the technology must first learn from known outputs, then derive additional layers of abstraction to reach predictions that refine itself as the machine learns."[8]

Starting with the basic definition of AI as a *technology that learns*, a number of terms expand the conversation to cover different types of technologies. These include:

Machine Learning: In this kind of AI, a computer examines sets of data and patterns to improve its own ability to understand that data. The model can be "trained," or train itself, to deliver increasingly consistent results.

Supervised Learning: In this type of function, humans input sets of labeled data into the AI system or application, which then analyzes and learns from that data to achieve the desired outcome. IBM's AI and analytical software-driven supercomputer, Watson, is driven by a supervised learning function. Watson can help oncologists treat cancer cases, and it gained much publicity as it learned how to win at the television show "Jeopardy!" As supervised learning becomes more widespread, it is likely to increase demand for workers with skills to manage the data input that "teaches" the AI technology.

Unsupervised Learning: On the other end of the spectrum is "unsupervised" learning, in which a massive amount of data is fed into the AI, the machine, which then "figures out" what it's supposed to do based on the information provided. This approach enables systems to be built around unstructured rather than structured data. Since most of the world's data is unstructured, unsupervised learning, still in its infancy, has the potential to unlock much of this data for AI applications.

TALENT STRATEGY PERSPECTIVE:

"That's Not Real AI" and Other True but Misleading Observations

Brian Delle Donne
President, Talent Tech Labs, LLC

Every day, I see first-hand how companies are building smart technology applications that can potentially revolutionize the way talent acquisition gets done. But in between potential and reality is a road full of tough questions, general assumptions, and opinions. These views will determine if and how a technology gains investment, makes it to market, and succeeds in delivering value.

Any talent acquisition decision maker owes it to herself and to the business to follow the development of AI innovation in particular. It is evolving quickly. The tools of AI can provide a talent advantage. Competitors are on the lookout for new solutions, and no one can afford to be left behind in a global environment of talent scarcity. At the same time, the "noise" of market commentary and personal opinions, while containing some truth, can also be misleading. Here are three common opinions companies should consider beyond face value.

"That's not real AI."

Machine learning is still in its infancy, so many innovations that market themselves as AI actually are not. But whether a solution is able to process information in an unstructured way and then learn from that function to improve output is only part of the value equation. For example, much of what was simply leveraging big data and predictive analytics was sometimes referred to as AI. Similarly, automated workflows have been called AI. While neither of these are really artificial intelligence, if a solution does a good job at delivering relevant and accurate predictive information to drive talent acquisition, it's probably worth a look, regardless of if it is correctly labeled as AI.

"Recruiters will be a thing of the past."

AI has the potential to improve recruitment productivity, which will enable recruiters to spend more time deepening relationships with employers and job seekers. This shift will require recruiters and the talent acquisition team to change how they work, but the job of the recruiter and the talent acquisition function will be very important. It will require technical skills to guide the technology and keen personal skills to be the true face of human interaction. More than ever, people will be responsible for providing strategic vision and guidance after technology automates the repetitive tasks out of the recruiting equation.

"We're not ready for AI in our talent function."

This is certainly true of AI. No business is ever ready for any innovation, yet history shows that with every trend, organizations eventually embrace change and turn it into a competitive advantage. Slow movers are left to adapt later as a way to keep up with the market. Businesses should not be intimidated by AI innovation; rather, they should keep an eye out for developments that could help them work smarter today, while also keeping the long-term conversation alive as they plan their future strategies.

Deep Learning: This type of AI is used for language translation, medical diagnosis, and image identification. The deep learning function is characterized by an ability to build hierarchies of abstractions, sort through complex sets of data, and deliver highly accurate results.

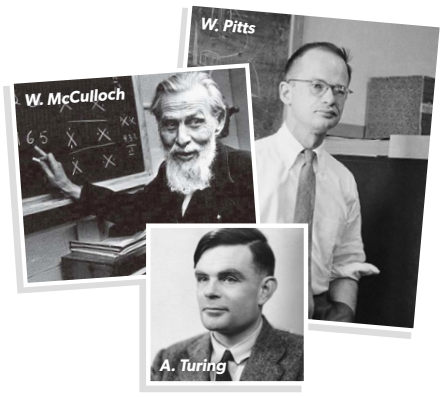
Natural Language Processing (NLP): Language requires interpretation and understanding from information that is often ambiguous and variable in meaning. NLP applies machine learning algorithms that process ambiguous input and, in the process, interpret spoken language.

Neural Network: A neural network consists of interconnected pieces that process information working together, similar to the pattern of neurons in the human brain. Weather prediction and facial recognition are examples of this type of deep learning technology.

General AI: Finally, there is general AI, the stuff of science fiction. Whereas today's AI is based on "narrow AI," a function in which the machine is focused on achieving specific, human-defined results, general AI acts independently of human guidance. In other words, the machine doesn't just learn how to do what it's told; rather, it decides what to do. General AI represents the mature state of AI in which a robot can independently reason through any problem just as a human would. Most experts agree that this level of intelligence is still decades away.

These terms represent only a sampling of vocabulary associated with AI, and they indicate a variety of differences in types of models and levels of sophistication. The lesson here is that AI is a broad area of innovation and not a particular technology type. As today's innovative AI applications become mainstream, expect businesses to adopt them as table stakes for competing in their fields. Notably, the pace of innovation is rapidly accelerating.

A Sudden Explosion in Interest: 70+ Years in the Making



Just a few years ago, AI was widely viewed as an interesting topic and promising possibility for the future. Now, AI is grabbing headlines, generating new business, and drawing major investment. The roots of this seemingly overnight sensation began more than 70 years ago.

In 1943, neuroscientist Warren McCulloch and logician Walter Pitts published a paper that laid the groundwork for exploration into AI. In the late 1940s, Alan Turing, noted for his work in helping to unlock German Enigma code in WWII, turned his focus to building machines that apply the thought processes of the human brain.

Over the subsequent decades, the field of AI progressed through a jarring start-and-stop history of major advancements followed by setbacks known as "AI Winters." Today, this boom and bust cycle is being replaced by a steady stream of innovation along with an explosion of investment in new AI technology.

A 2016 report by analyst group IDC predicts revenues from cognitive systems and AI technologies will jump from $8 billion in 2016 to more than $47 billion in 2020.[9] Large digital companies, including IBM, Alphabet (Google), Microsoft, Amazon, Baidu, Apple, and Facebook, are all investing in AI.

Behind the recent surge in AI development is a confluence of forces. Computers are faster and cheaper than ever. Data is everywhere. Advances in machine learning, deep learning, and NLP are driving breakthroughs in areas such as big data analysis and speech recognition — opening a world of potential new applications. These developments only touch the surface. A deeper look reveals a range of social, commercial, and technical factors behind the surge in AI use and interest, including the following:

SOCIAL FACTORS

- **Population stagnation** or decline in many countries, notably Japan and Germany, is creating interest in automation technology to offset declining working-age populations.
- **Critical talent shortages**, driven by demographic shifts in the workforce and misaligned education and immigration policies, are forcing many enterprises to invest in automation technology to fill the talent gaps.

COMMERCIAL DEVELOPMENTS

- **Enterprise-wide adoption of the internet and mobile technology** has created a ubiquitous digital environment for Software as a Service (SaaS) and application-based technology — areas where AI can thrive.
- **Rapid "digitization" across industries** is generating enormous amounts of new data potentially useful for business decisions.
- **Professional services providers are building practice groups around AI**, something they would not do unless there is money to be made.

IN THEIR WORDS:

Competing in the AI Market

"We've made major strides in artificial intelligence just in the past five years, achieving milestones many people who have devoted their lives to the field wouldn't have thought possible."[10]

HARRY SHUM, EVP, MICROSOFT AI RESEARCH GROUP

"Everything that can be automated, will be."[11]

ROBERT CANNON, INTERNET LAW AND POLICY EXPERT

"We are at a turning point in seeing CEOs take the decision to adopt true digital labor as their differentiation strategy."[12]

CHETAN DUBE, PRESIDENT & CEO, IPSOFT

"We're working on some of the world's most complex and interesting research challenges, with the ultimate goal of solving intelligence. [Our] approach is yielding rapid progress."[13]

INTRODUCTION TO DEEPMIND RESEARCH

TECHNOLOGICAL ADVANCES

- **Improvements in computer processing power** coupled with decreases in the price of hardware have enabled the widespread, low-cost availability of the basic technology required for AI.
- **Dramatic improvements in memory storage and price** have given large players in the industry the ability to collect and hold the vast amounts of data needed to drive AI.
- **Exponential technologies** such as 3D printing, virtual and augmented reality, alternative energy systems, biotechnology, and digital medicine are sparking a new round of innovation.
- **Dramatic improvements in analytics** are making new data available for predictive analysis and machine learning.
- **Major breakthroughs in NLP and machine learning** have conclusively demonstrated the value and potential of AI deployment.

The Path Ahead: Big Investment Fuels Big Advances

With IDC predicting a $47 billion market for AI by 2020 and other analysts forecasting even larger advances, it's no surprise that many companies are going all in for AI investment and development. According to market intelligence firm CB Insights, over 200 AI-focused companies raised nearly $1.5B in equity funding by June 2016,[14] but the major race to dominate AI is being pushed by the large players, including Microsoft, Amazon, IBM, Alphabet (Google), Baidu, Apple, and Facebook. Each is investing heavily and looking to build on the advantages they enjoy due to their access to large pools of data.

Microsoft, Amazon, and IBM all released recent toolkits designed to develop AI applications.

The strides being made by these players are significant. Consider that Microsoft, Amazon, and IBM all released recent toolkits designed to develop AI applications. IBM is selling services based on its Watson cognitive computing technology. Meanwhile, Microsoft is incorporating its machine learning into Azure application tools, and Amazon President Jeff Bezos heralded the importance of AI as the large trend that businesses can't afford to ignore. Notably, in addition to externally visible products such as Alexa, Bezos points out that Amazon has also made "higher level services available in a convenient form. Amazon Lex (what's inside Alexa), Amazon Polly, and Amazon Rekognition remove the heavy lifting from natural language understanding, speech generation, and image analysis. They can be accessed with simple API [application program interface] calls — no machine learning expertise required."[15]

Finally, U.S. government research and development continues to play a large role in the advancement of AI. The Defense Advanced Research Projects Agency (DARPA), the U.S. Department of Defense agency devoted to technology innovation for the military, is beginning to focus on "developing implantable devices that can perform computing functions similar to a desktop or laptop computer."[16]

This type of project represents the growing intersection of machine and human functionality, but the agency itself notes that true AI is a goal that is well beyond today's most advanced applications. As a result, the agency has also recently launched what it calls its Lifelong Learning Machines (L2M) program. This four-year program will be committed to taking currently available AI systems to a new level of sophistication on par with biological intelligence.[17] While not as flashy as the implantable chip, the L2M project may have a broader impact on AI. In both cases, the goals of DARPA projects are ambitious, but DARPA research has historically led to life-changing outcomes. Consider the internet and email in the 1960s and 1970s.[18]

THE RACE IS ON

to turn the promise of AI into market success.

As large and small players move forward with AI innovations, they will continue to focus on applications related to fundamental AI "thinking" capability, as well as innovations focused on connecting, applying, and improving that capability. Major areas of investment include:

FUNDAMENTAL AI CAPABILITY ADVANCES

- **Large-Scale Machine Learning:** Scaling existing algorithms to work with extremely large data sets
- **Deep Learning:** Computer vision, video labeling, activity recognition, audio, speech, and NLP
- **Reinforcement Learning:** Improving decision making that is experience-driven and sequential
- **Algorithmic Game Theory and Computational Social Choice:** Developing systems that are "human aware," with the ability to make decisions and learn from them
- **Neuromorphic Computing:** Advancing systems that mimic neuro-biological architectures present in the nervous system
- **Natural Language Processing:** Developing refined systems that can interact with humans

EXPANDING AI CONNECTIONS AND EVOLVING APPLICATIONS

- **Robotics:** Training a robot to interact with the world around it in generalizable and predictable ways, including the manipulation of objects
- **Collaborative Systems:** Models and algorithms to help develop autonomous systems that work collaboratively with other systems and humans
- **Computer Vision:** Automated image and video capture; deep learning-enabled computer vision that exceeds human capability in some areas
- **Internet of Things (IoT):** The interconnection of computing devices in everyday objects (appliances and buildings) that can send and receive data
- **Autonomy and Automation:** The ability of a system to operate and adapt to changing circumstances with reduced human control (e.g., innovations in some financial trading systems and expected applications to cars, trucks, buses, and aviation)
- **Crowdsourcing and Human Computation:** Augments computer systems using innovative approaches to harness human intelligence
- **Analytics and "Big Data" Science:** Advanced processing techniques and algorithms developed by AI researchers to analyze vast amounts of data to achieve relevant insight

Dorothy was Right! (Almost)

The development of AI will likely accelerate over the next several decades, and its influence on business and society will continue to grow. When it comes to AI innovation and impact, "The Wizard of Oz" cliché rings true, "We are not in Kansas anymore." The slow pace of development and setbacks are now part of the past, and for business and talent leaders, that means the world of AI is only beginning to unfold.

MEANWHILE, IN KANSAS...

> A local entrepreneur is working with feedlots in Lawrence and Wamego, Kansas, "to test cameras that take photos of the feeding cattle every five seconds and send them through an AI algorithm. … As the algorithm 'looks' at thousands of the photos, it learns to identify which cows are getting sick based on whether they are eating."[19]
>
> ***— THE KANSAS CITY BUSINESS JOURNAL (DECEMBER 9, 2016)***

> Just across the river, Kansas City, Missouri-based "H&R Block is rolling out a collaboration with IBM that will rely on computing power to help determine optimum credits and deductions on clients' tax returns. H&R Block and IBM fed the Watson computing system about 600 million tax return data points and 'taught Watson the language of tax," said Block spokesman Gene King.[20]
>
> ***— THE KANSAS CITY STAR (FEBRUARY 1, 2017)***

GETTING REAL ABOUT AI:

ISSUES, FACTS, AND THE BOTTOM LINE

ISSUE: AI is a Risk to Humans

"The potential benefits [of AI] are huge. … Success in creating AI would be the biggest event in human history. It might also be the last, unless we learn to avoid the risks."[21]

- **STEPHEN HAWKING, noted theoretical physicist, cosmologist, and author**

"I think we should be very careful about artificial intelligence. … Increasingly scientists think there should be some regulatory oversight maybe at the national and international level, just to make sure that we don't do something very foolish."[22]

- **ELON MUSK, South African-born entrepreneur, known for founding Paypal, Tesla Motors, and SpaceX**

"First the machines will do a lot of jobs for us and not be super intelligent. That should be positive if we manage it well. A few decades after that, though, the intelligence is strong enough to be a concern."[23]

- **BILL GATES, American business magnate, investor, author, and philanthropist, co-founder of Microsoft**

S. Hawking


E. Musk


B. Gates

BOTTOM LINE:

Some of today's brightest minds are raising concerns about AI, but nearly all agree that it is a long way from going out of control. Diligence in policy and regulation will be important in the future.

ISSUE: Machines Can Compete Against Humans Today

As some applications of AI reveal, the technology is very powerful — even in its current state.

AI fighter pilot wins combat simulation:

"Not only could he [Veteran Combat Pilot Col Lee] not score a kill against it [the AI], he was shot out of the air by the reds [the AI] every time after protracted engagements."

- BBC, June 2016[24]

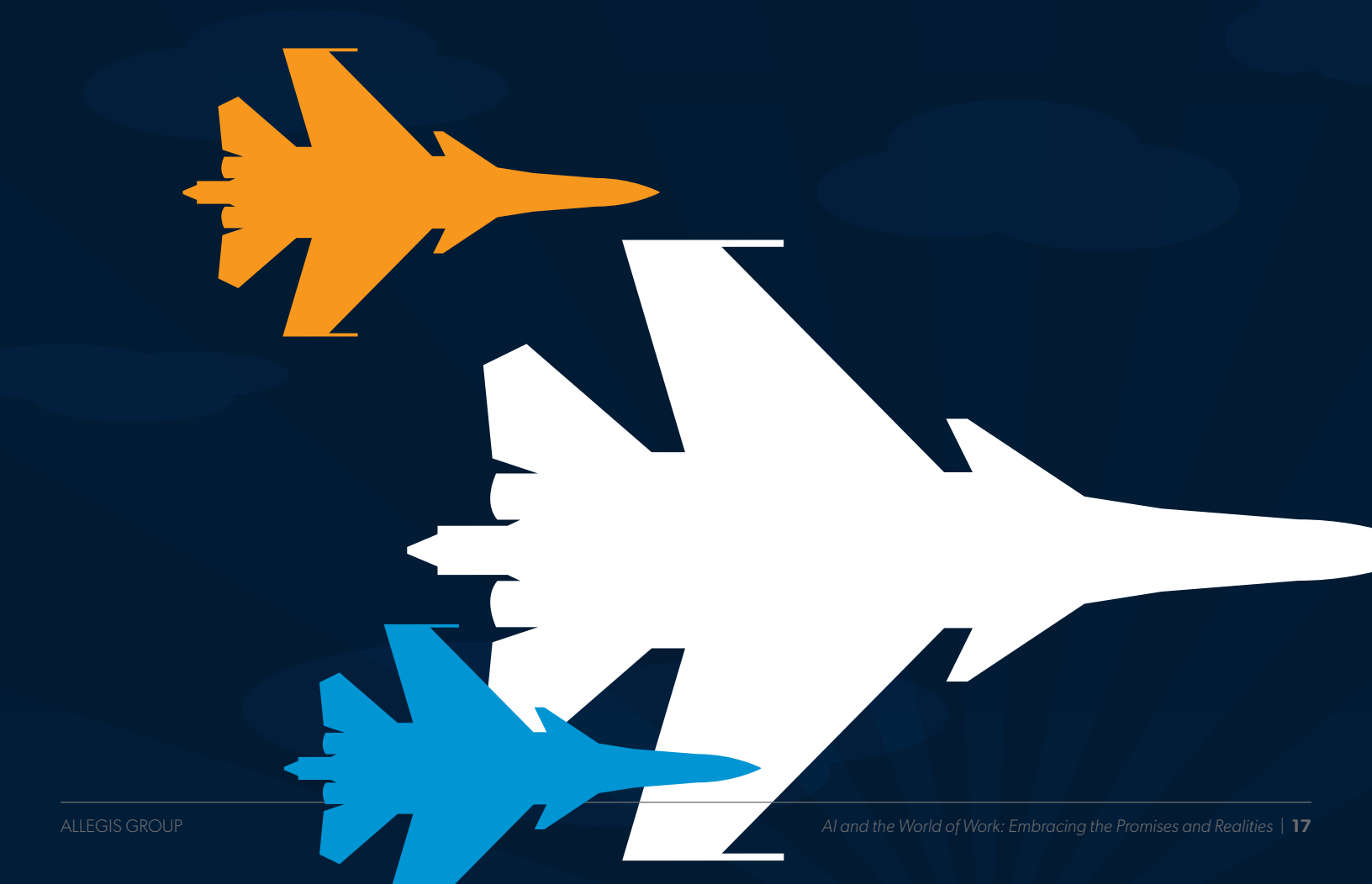
DARPA and the U.S. Navy unveil an autonomous Sea Hunter warship:

DARPA has worked with the U.S. Navy to develop the aptly named ship Sea Hunter. The ship "can operate for months at a time without crew or human control, and is set to be a game changer for the future of US naval operations."

- The Manufacturer, April 2016[25]

BOTTOM LINE:

AI is being applied in ways that may one day pit machines against humans in a real conflict situation. For now, however, no system today is positioned to think completely independently or turn against humans.



ISSUE: New Challenges Will Influence AI Effectiveness

Beyond the dramatic commentary about the risks to humanity, experts point out a number of concerns that will eventually be addressed as developers, users, and regulators work with AI technology:

- **Data Control and Information Security:** How can AI be prevented from exploiting vulnerabilities in existing data systems, and how can AI be stopped from acting on low-quality data?
- **Artificial Bias:** AI may be taught using biased input, including unconscious bias that is reflected in data access and input by human "trainers."
- **Black Box Rationale:** If humans cannot see or understand the inner workings of an AI decision process, how can it be confirmed that biases or inaccuracies aren't tainting the output?
- **Impact of Failure:** No technology is flawless. Can an AI be trusted to fly planes and drive cars? What happens if or when a system shuts down unexpectedly?
- **Misplaced Reward Function:** AI can be "trained" through an incentive to produce an outcome, but that same incentive may unintentionally encourage unexpected or undesirable results. Can unintended outputs be controlled or prevented?
- **Jobs, Wealth Distribution, and Labor Law:** With AI running manufacturing, productivity may increase dramatically at little cost. Where and how will people still be employed?
- **Product Liability and Criminal Responsibility:** If a self-driving taxi crashes, the company will face litigation. If a company is sued for compliance violations due to flawed diversity sourcing by its AI program, the exposure will be real. Organizations may not be prepared for these new liabilities.
- **Perpetual Obsolescence:** AI will evolve quickly. Will the solution a company deployed six months ago be surpassed with a better, cheaper product before the end of the year?
- **Malicious Use:** What happens if a disgruntled employee rewrites AI input data that leads to poor decisions and bad outcomes? What other ways will people misuse AI, and can its intentional misuse be prevented?

BOTTOM LINE:

It is likely that these near-term challenges will demand attention from business and public policy decision makers; however, it is likely that most of these issues will be solved or mitigated over time.

ISSUE: Current Constraints May Influence The Pace of Innovation

Experts cite some challenges that won't derail AI innovation but may influence the pace of development and adoption over the coming years:

> **Human Training:** Current machine learning-driven AI systems require significant human guidance and programming, and a shortage of skills to provide this guidance may hinder progress.

> **Quality Pools of Data:** Today's AI systems require deep sets of data and information. While data is abundant, it is not always available in pools that can be used to support an AI application.

> **Knowledge of AI Systems:** AI requires human buy-in and adoption. At present, relatively few people have the knowledge to be effective evangelists for the technology within their organizations.

> **Open AI Architecture:** The role of virtual assistants in managing the "Internet of Things" will require the "open AI architecture" approach as a standard, as closed architecture makes interaction with third-party applications difficult or impossible. This standard is not in place yet.

> **Cost of Upgrading:** AI technology is evolving quickly. That means companies will have to commit a budget for upgrades and new advances. It is too early to forecast how AI will impact corporate spending.

> **Regulation:** New technologies require new laws related to their use. Consider the impact of new laws to ensure the safety of automated vehicles, for example. Will these regulations encourage new inventions or hinder innovation? Time will tell.

BOTTOM LINE:

While today's constraints represent obstacles to certain aspects of AI development, they are viewed as the growing pains of new technology. These constraints are likely to diminish over time, yet new, unforeseen challenges may arise in their place.

AI'S IMPACT ON JOBS:

Reading Tea Leaves

THE INDECIPHERABLE

Thanks to AI, the jobs landscape will be vastly different in the years to come. Businesses and governments are worried about the shift as machines take on complex, thought-driven tasks and take away work from people traditionally considered irreplaceable. And for business or talent decision makers, the impact of AI on the way work gets done may change the nature of workforce strategy in the very near future.

What will that future be? When it comes to jobs, the tea leaves are indecipherable as analysts grapple with emerging technologies, new fields of work, and skills that have yet to be conceived. The only certainty is that jobs will change. Consider the conflicting predictions put forth by the analyst community:

- According to the Organization of Economic Cooperation and Development,[26] **only 5-10% of labor would be displaced by intelligent automation**, and new job creation will offset losses.
- The World Economic Forum[27] said in 2016 that **60% of children entering school today will work in jobs that do not yet exist**.
- **47% of all American job functions could be automated within 20 years**, according to the Oxford Martin School on Economics in a 2013 report.[28]
- In 2016, a KPMG study estimated that **100 million global knowledge workers could be affected by robotic process automation by 2025**.[29]

Despite the conflicting views, most analysts agree on one thing: big change is coming. Venture Capitalist David Vandergrift has some words of advice: "Anyone not planning to retire in the next 20 years should be paying pretty close attention to what's going on in the realm of AI. The supplanting (of jobs) will not happen overnight: the trend over the next couple of decades is going to be towards more and more automation."[30]

While analysts may not agree on the timing of AI's development in the economy, many companies are already seeing its impact on key areas of talent and business strategy. AI is replacing jobs, changing traditional roles, applying pressure on knowledge workers, creating new fields of work, and raising the demand for certain skills.

Replacing Human Workers: A Closer Look at RPA

While it's easy to focus on particular industries and skills impacted by AI, the larger story may prove to be the impact of AI on *how* work gets done. Robotic process automation (RPA) is one example of a fundamental advance in applying technology as part of the workforce. This area of AI is driven by an intelligent agent that functions very much like a virtual employee, automating many office functions with a minimal investment in IT and support.

Notably, the virtual employee can be trained by any human knowledgeable on the process, rather than an IT specialist. RPA is expected to significantly impact business process outsourcing (BPO) as this type of technology can be easily implemented within existing client systems and processes. At present,

RPA has found widespread traction in the financial services industry and can be expected to expand from there.

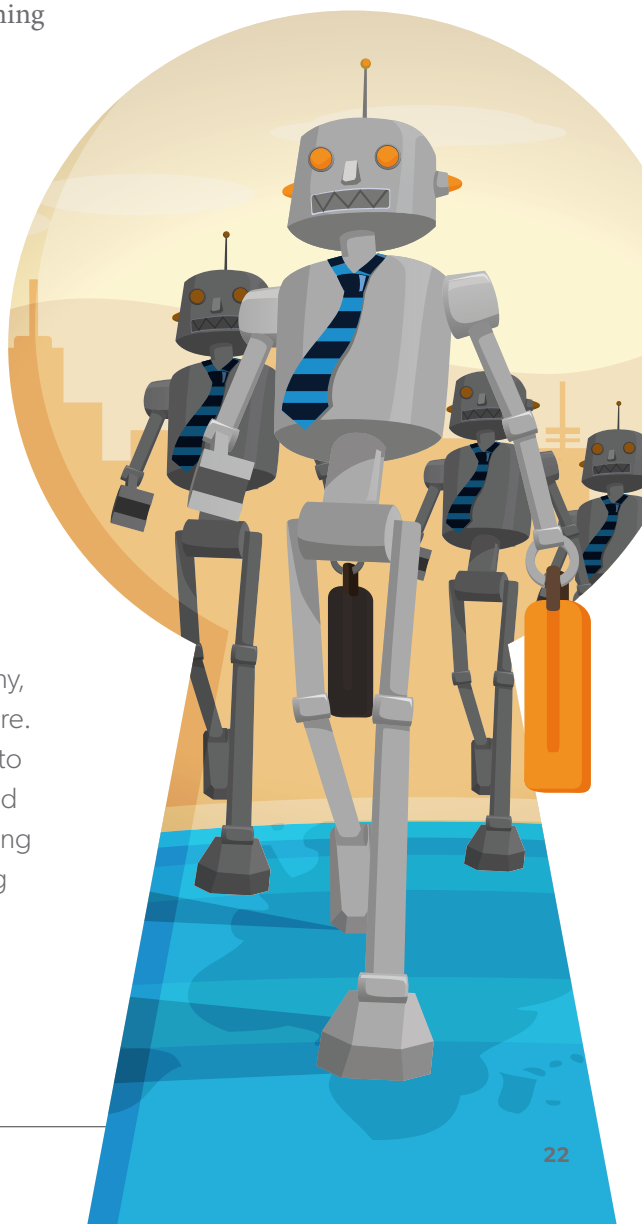
RPA has found widespread traction in the financial services industry and can be expected to expand from there. Key advantages include:

> **Scalability and Cost:** RPA is projected to have a particularly strong impact on the BPO model. It is capable of managing many routine tasks performed by humans at a lower cost while offering greater flexibility and scalability. A key advantage of RPA is that it can scale up or down without additional human resources or IT infrastructure.

> Ease of Deployment: RPA is expected to achieve rapid adoption because it can deploy onto an enterprise technology platform without a substantial investment in hardware, specialized personnel, or application development.

> Adoption: Both Accenture and KPMG now have dedicated RPA practice groups. Other professional services providers will likely follow suit as the technology becomes widespread.

> RPA Versus True AI: A 2016 CIO magazine article[31] points out that RPA is not true AI. RPA uses traditional computing technology to drive its decisions and responses, but it does this on a scale large and fast enough to roughly mimic the human perspective. AI, on the other hand, applies machine and deep learning capabilities to go beyond massive computing to understand, learn, and advance its competency without human direction or intervention — a truly intelligent capability. RPA is delivering more near-term impact, but the future may be shaped by more advanced applications of true AI.



Transforming Roles: New Pressures on the Knowledge Worker

RPA is an excellent example of how companies are leveraging AI to fulfill needs today, but that is only the beginning of the story. For many, the real question about AI relates to its impact on the jobs of the future. For example, talent industry analyst Josh Bersin says AI is positioned to change how work is done and create new jobs: "What we concluded is that what AI is definitely doing is not eliminating jobs; it is eliminating tasks of jobs, and creating new jobs, and the new jobs that are being created are more human jobs."[32]

Deloitte's Human Capital Trends Report also recognizes a changing demand for skills among organizations due to the growing footprint of AI technology. The future will increase the value of workers with a strong learning ability and strength in human interaction. On the other hand, today's highly paid, experienced, and skilled knowledge workers may be at risk of losing their jobs to automation. Ironically, the best qualities for tomorrow's worker may be the strengths usually associated with children.

"Learning has been at the center of the new revival of AI. But the best learners in the universe, by far, are still human children," notes University of California, Berkeley Psychologist Alison Gopnik. "At first, we thought that the quintessential preoccupations of the officially smart few, like playing chess or proving theorems — the corridas of nerd machismo — would prove to be hardest for computers. In fact, they turn out to be easy. Things every dummy can do like recognizing objects or picking them up are much harder. And it turns out to be much easier to simulate the reasoning of a highly trained adult expert than to mimic the ordinary learning of every baby."[33]

The emphasis on learning is a key change from previous decades and rounds of automation. Advanced AI is, or will soon be, capable of displacing a very wide range of labor, far beyond the repetitive, low-skill functions traditionally thought to be at risk from automation. In many cases, the pressure on knowledge workers has already begun.

Consider recent developments:

DOCTORS

AI technology has started to impact skilled professions such as physicians, as IBM's Watson has demonstrated superiority to humans across a growing range of medical functions.

LAWYERS

The legal profession is in a state of flux as powerful machine learning systems supplant the traditional roles filled by paralegal professionals and, increasingly, attorneys themselves.

ACCOUNTANTS

New machine learning-based applications are rapidly automating core corporate treasury and finance functions while accounting firms are developing technology to supplant their own CPAs and tax specialists.

JOURNALISTS

AI is impacting the traditional role of newspaper reporters as existing technology writes financial and sports reporting for many major media outlets.

INFORMATION SECURITY TECHNICIANS

DARPA is investing heavily in automating network security maintenance, in part out of a belief that threats and changes occur too fast for a human to manage. Other organizations are also involved in similar efforts.

PILOTS

AI applications are increasingly being used to do the job of airline pilots. While the ability to fully replace commercial pilots is debatable, AI may reduce the number of pilots or co-pilots needed to fly a plane.[34]

In addition to its effect on traditional knowledge workers and skilled positions, AI may influence another aspect of the workplace: gender diversity. According to Stanford AI expert Jerry Kaplan, "Men hold 97 percent of the 2.5 million U.S. construction and carpentry jobs. … [These] male workers stand more than a 70 percent chance of being replaced by robotic workers. By contrast, women hold 93 percent of the registered nurse positions. Their risk of obsolescence is vanishingly small: .009 percent."

He continues, "Many occupations that might appear to require experience and judgment — such as commodity traders — are being outdone by increasingly sophisticated machine-learning programs capable of quickly teasing subtle patterns out of large volumes of data. … If your job involves distracting a patient while delivering an injection, guessing whether a crying baby wants a bottle or a diaper change, or expressing sympathy to calm an irate customer, you needn't worry that a robot will take your job, at least for the foreseeable future."[35]

The impact of AI on specific types of knowledge workers is difficult to predict as AI is only just beginning to tackle the types of work that doctors, engineers, lawyers, and writers do. Regardless of industry, however, AI is a real challenge to today's way of thinking about work, value, and talent scarcity. AI will expand and eventually force many human knowledge workers to reinvent their roles to address issues that machines cannot process.

At the same time, AI will create a new demand for skills to guide its growth and development. These emerging areas of expertise will likely be technical or knowledge-intensive fields. In the near term, the competition for workers in these areas may change how companies focus their talent strategies.

New or Expanding Fields of Expertise and Growing Skills Demands

What types of skills will be needed to fuel the development of AI over the next several years? The answer is subject to debate, but most observers agree on several fields of new opportunity. These prospects include:

- **Ethics:** The only clear "new" job category is that of AI ethicist, a role that will manage the risks and liabilities associated with AI, as well as transparency requirements. Such a role might be imagined as a cross between a data scientist and a compliance officer.
- **AI Training:** Machine learning will require companies to invest in personnel capable of training AI models successfully, and then they must be able to manage their operations, requiring deep expertise in data science and an advanced business degree.
- **Internet of Things (IoT):** Strong demand is anticipated for individuals to support the emerging IoT, which will require electrical engineering, radio propagation, and network infrastructure skills at a minimum, plus specific skills related to AI and IoT.
- **Data Science:** Current shortages for data scientists and individuals with skills associated with human/machine parity will likely continue.
- **Additional Skill Areas:** Related to emerging fields of expertise are a number of specific skills, many of which overlap various fields of expertise. Examples of potentially high-demand skills include modeling, computational intelligence, machine learning, mathematics, psychology, linguistics, and neuroscience.

A New "Old" Challenge in the Job Market

Concern about automation and its impact on jobs is nothing new. In 1928, a New York Times headline declared, the "March of the machine makes idle hands."[36] That article referenced the reduction in work in agriculture while output subsequently rose due to new farm machines.

Long after that observation on the eve of the Great Depression, observers continued to worry over the impact of automation. According to a recent Economist article, "Panics about 'technological unemployment' struck in the 1960s (when firms first installed computers and robots) and the 1980s (when PCs landed on desks)."[37] As advances in technology posed a perceived threat to many workers, numerous companies also viewed innovation as a threat to business. Rather than enter the innovation discussion, companies would take a "wait and see" approach, adopting new solutions when they were proven and safe. The risk today is that when innovation happens quickly, a "wait and see" mindset will leave a company well behind its competitors.

Andrew Ng, former chief AI scientist at Baidu Research, co-chairman and co-founder at Coursera, and Stanford University adjunct professor, points out, "In the past, a lot of S&P 500 CEOs wished they had started thinking sooner than they did about their internet strategy. I think five years from now there will be a number of S&P 500 CEOs that will wish they'd started thinking earlier about their AI strategy. AI is the new electricity. Just as 100 years ago electricity transformed industry after industry, AI will now do the same."[38]

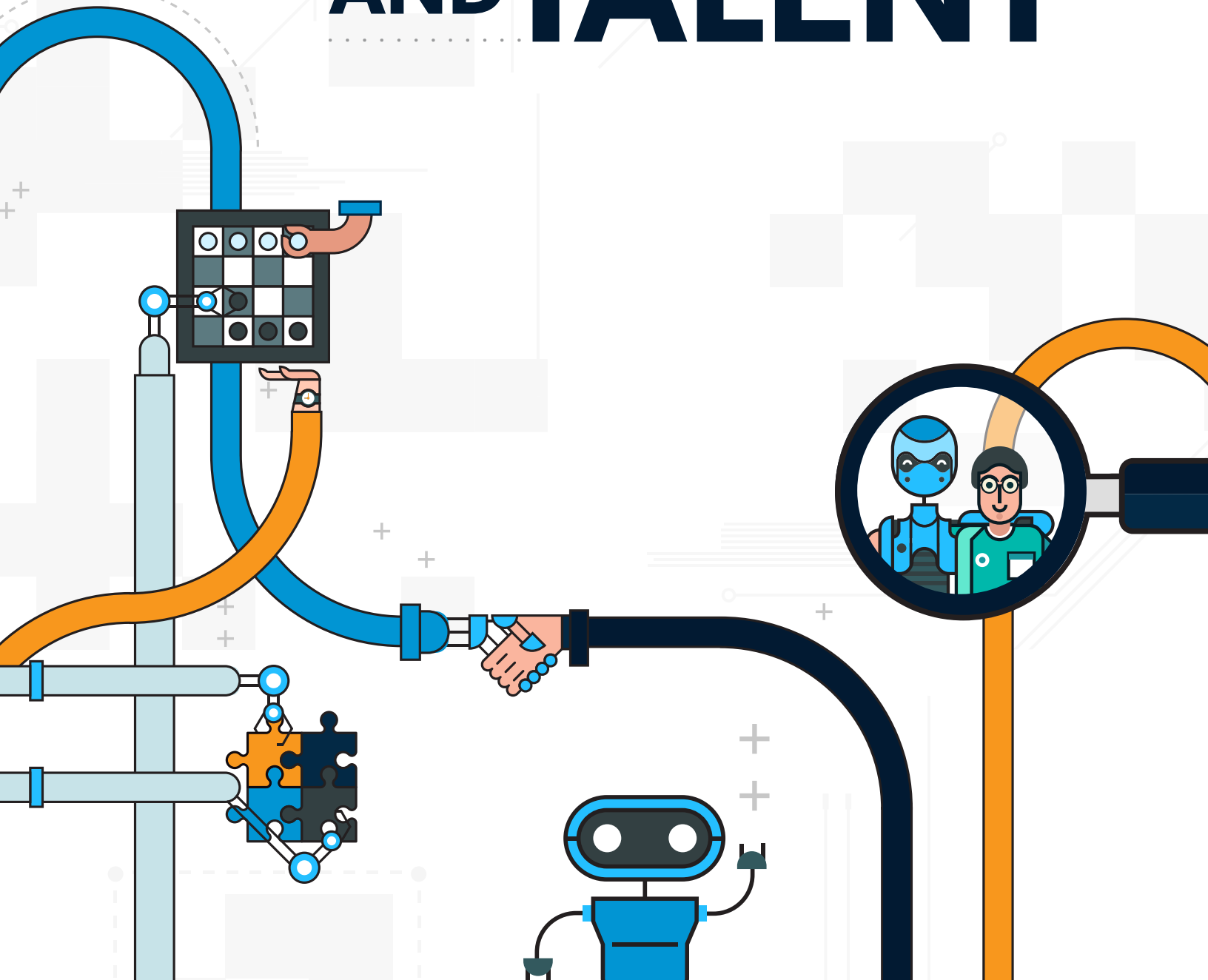
For companies considering their talent needs, these lessons of past innovations should loom large. The development of the internet showed how new technologies could take away jobs and create new ones. It showed how the companies that ignore change find it difficult to catch up. No business wants to fail. No one wants to be the Blockbuster Video of the AI era, but few companies are stepping up to stay ahead of the curve. The lesson: as the jobs that support AI evolve, companies must be prepared to secure new skills. A proactive approach to the AI-driven landscape of work can be a key ingredient to a talent advantage in the future.

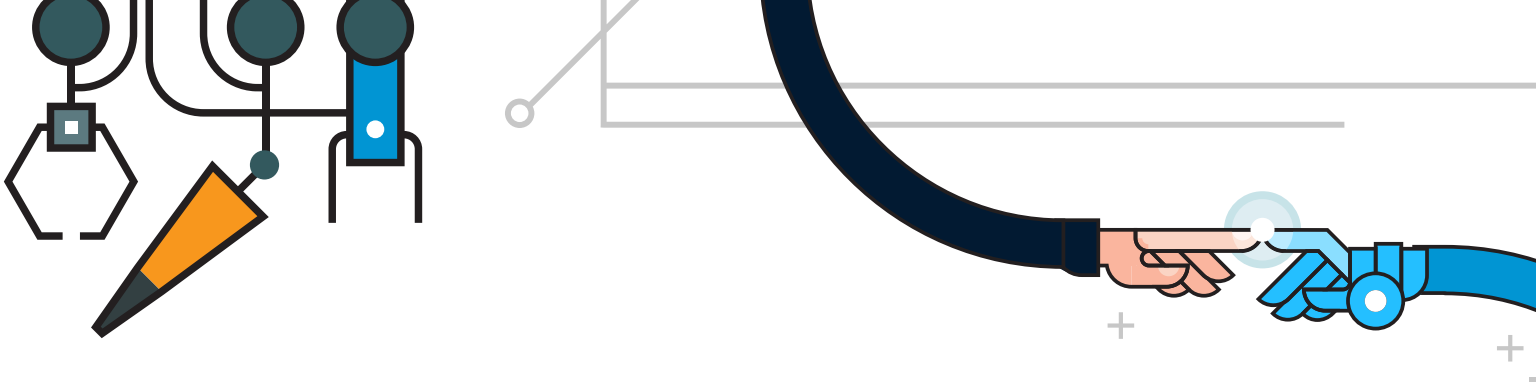
> *"I think five years from now there will be a number of S&P 500 CEOs that will wish they'd started thinking earlier about their AI strategy.* ***AI is the new electricity****."*

ANDREW NG, LEADING AI EXPERT

IMPACT ON HR:

Transforming the Dynamics of + + BUSINESS AND TALENT





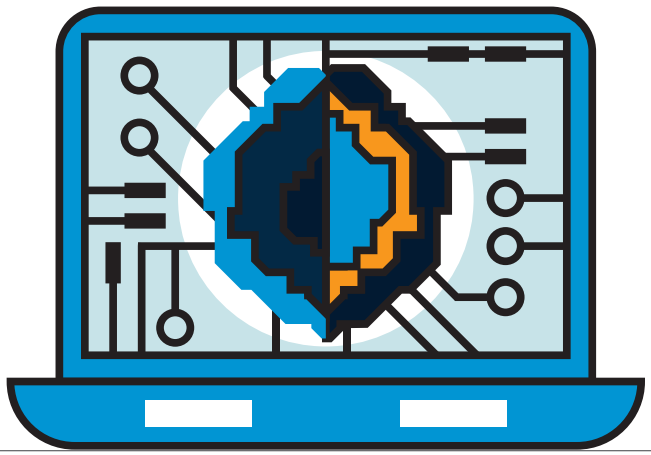
Over the past decade, companies have struggled to keep up with the challenges of securing critical talent. Demand for many skills exceeds the supply. A large, experienced Baby-Boomer generation is approaching retirement, and younger Millennial and Gen Z workers bring new values, including a natural affinity for all things digital.

Against this backdrop of change and talent scarcity, data is everywhere. As a result, companies are embracing innovations that use data to improve how they identify, attract, and retain workers. That push began with early advances in enterprise HR systems and applicant tracking solutions. It then gave way to advances in recruitment marketing, social applications, mobile technologies, and big data and analytics. Now, there's a new force driving talent innovation. Enter AI — a natural, next step in the evolution of talent strategy and technology.

AI represents a progression that will do more than provide tools to support HR and talent management processes; it is likely to change the processes themselves. Will AI drive the same level of change that web-based solutions did 20 years ago to move HR away from Rolodexes, bulletin boards, and want ads? The answer is, "very likely," but change will take time. An understanding of tomorrow's AI-enabled HR begins with a view of AI today and a look at the potential future impact across talent acquisition and HR of tomorrow.

AI at Work in HR and Talent Today

AI adoption is still in its early stages. Many breakthroughs are still working their way from research to commercialization; however, a number of practical applications are emerging. Consider IBM's ambitious entrance into the market. According to a recent Deloitte report, "IBM's AI pioneer, Watson, is now moving into the space with three new technologies: a machine learning platform that ranks the priority of open requisitions; social listening for an organization's and competitors' publicly available reviews on Glassdoor, Twitter, and newsfeeds; and a tool that matches candidates to jobs through a 'fit score' based on career experiences and skills."[39]



In addition to the large presence of IBM, the report also cites a number of smaller AI startups, including:

- **Wade and Wendy:** Based on AI chatbots, this service acts as a virtual career guide for candidates (Wade) and an in-house hiring assistant for employers (Wendy). By bringing an automated conversational approach to the recruiting process, the Wade and Wendy solution promises to boost clarity and eliminate communication gaps between companies and prospective candidates.
- **Mya:** This chatbot was introduced by FirstJob, a company dedicated to helping organizations recruit Millennial talent. Mya is billed as an AI recruiter that can reduce a recruiting team's time demands by 75% through automating sourcing, screening, and scheduling, all while providing candidates with a "positive and helpful" experience.
- **Olivia:** Developers at Recruiting.Ai are transforming recruiting software through the power of NLP and AI. Olivia is the company's flagship product, designed to build a better candidate experience through an AI-powered personal assistant.
- **Switch:** This recruiting app applies a machine-learning algorithm to match candidates with jobs. The app has been called "Tinder for recruiting," giving candidates and managers quick overviews of jobs and candidates to which they can swipe left to dismiss or swipe right to learn more.
- **Talent Sonar:** This system uses AI to prioritize job skills, develop job descriptions, review résumés, and create structures for effective interviews. The focus of Talent Sonar is to eliminate bias from all parts of the hiring process to improve hiring results.

These startups are just a few examples of new solutions at work today. Their early appearance reveals the range of issues that AI is positioned to address, from improving the candidate experience to accelerating the hiring process and boosting quality of hire.

TALENT STRATEGY PERSPECTIVE:

AI is Changing What It Means to be a Talent Partner to the Business — and That's a Good Thing

Bruce Morton
Head of Innovation, Allegis Global Solutions

We're starting to see the influence of AI on how companies engage talent every day. Jobs are changing. The demands for skills are changing, organizations are changing, and the expectations for a talent partner are changing, too. That means, whether you are an internal HR organization or a solutions partner to a company, you have to be willing to continually re-define how you provide value to the business.

Be an Advisor, Not an Order Taker

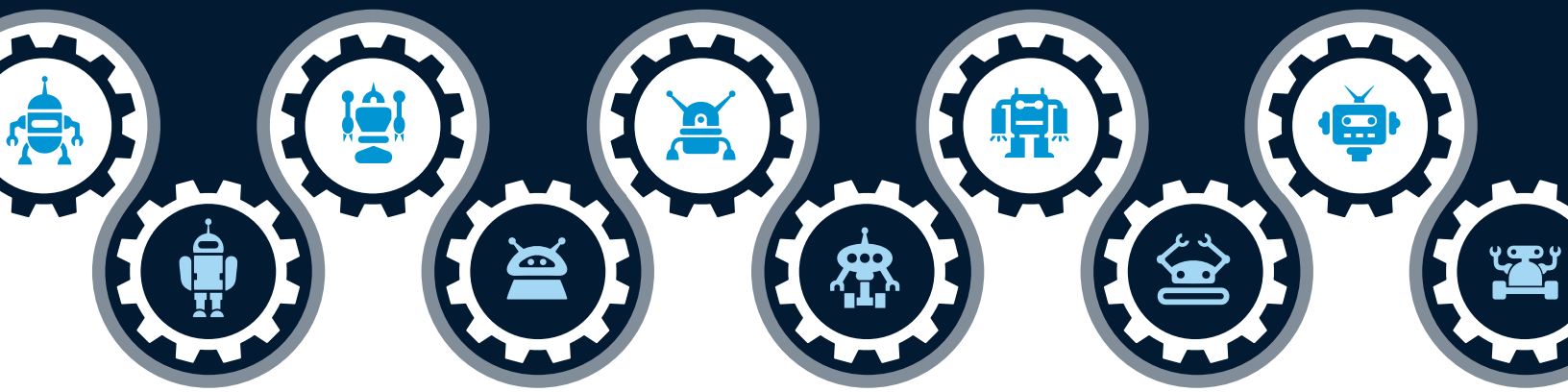
Successful solutions providers learned a long time ago that it is possible to fill every order a client has and still fail as a talent partner. If you can't question the job being sought, have input on the requirements, or guide the workforce discussion, you are only as valuable as the tasks you do — and AI will very quickly begin taking on those tasks.

As a talent partner, it's your job to ask the tough questions behind every task. Is this the right approach? How would a traditional employee do the work? Is the work best done by a freelancer, by multiple different contributors, or even by machines? You own the questions, and you solve the problems. The "activities" of talent and HR are part of what you do, but they are table stakes. Strategic value is everything. You have to get in front of the decisions, not react to them.

Re-Think How Work Gets Done

When being a partner to the business means taking on the tough questions, that's a great boost for talent and HR. Business leaders are realizing that work can be done by non-employees, but they need guidance on how that happens. Workers are realizing that they don't have to be full-time employees at one company in order to have a career, but they still need a sense of career guidance. By building the right relationships, the talent advisor can provide a truly human face to both the worker and the employer.

The talent advisor role will be increasingly important as the traditional definitions of business and work become blurred by the influence of technology. It's a scary time because it's a time of change, but it's an exciting time, too. HR and talent must rise to the occasion, and companies can no longer afford to expect less of their talent partners.



The AI Future: Driving a Strategic Talent Function

As AI solutions begin to reach the talent technology marketplace, innovation is likely to continue at a rapid pace, and it will be shaped by the persistent challenges faced by talent organizations. Many of those challenges stem from a struggle to balance a large volume of repetitive tasks, such as screening applicants and reviewing résumés, with a need to apply human skills, such as interacting with candidates and employees, solving issues, and creating strategies.

Ultimately, the goal of every HR and talent function is to rise above the fray of tactical day-to-day activity and gain a proverbial "seat at the table" in developing the core business strategy. AI will contribute to HR's voice in the business, not only by taking on much of the human burden associated with planning, talent acquisition, and talent management but also by facilitating more consistent processes and informed strategies along the way.

WORKFORCE PLANNING AND STRATEGY: THE POWER OF KNOWING

Backed by access to vast amounts of data, knowing should come naturally, right? Think again.

At its core, the job of HR begins with knowing. That means knowing the organization's industry and competitors, knowing the core strategy of its business, and knowing the details of its workforce plan. It involves getting to know hiring managers and candidates, job requirements, and real talent gaps. It means knowing the right hire — and knowing the workings of the individual employee after hire. Backed by access to vast amounts of data, knowing should come naturally, right? Think again.

Every path to knowledge involves processing information that is unstructured, subjective, and infinitely variable. When it comes to workforce planning and talent strategy, HR success requires an ability to turn that vast supply of information into relevant and actionable knowledge. AI is positioned to do just that. At a strategic level, look for AI to join big data and analytics to enable and support a powerful workforce planning function. At a tactical level, AI can provide benefits in many areas, such as helping to define individual job requirements.

Workforce Planning

Determining workforce needs is one of the most complex challenges in business. New demands for skills constantly arise. A growing mix of flexible labor is joining traditional employees in the workforce, and automation is forcing companies to question whether the "best person for the job" may be a machine.

An effective workforce planning function must accommodate these variables while also predicting attrition, identifying skills gaps, and discovering new opportunities to optimize the workforce. Thanks to powerful analytics tools, planners have the opportunity to develop a mature workforce planning function that delivers data-driven results, supports predictive planning, and even tests scenarios and outcomes. At present, the job of deciding inputs and data points in the planning process, as well as making judgments and evaluating outcomes, is still in the hands of humans. These functions are areas where AI has the potential to learn from analytics and help people build stronger workforce plans. Outside HR, the overlap of AI and analytics is already happening. As an example, consider Google Analytics' addition of automated insights to its mobile app. According to Google, "this addition to Google Analytics lets you see in 5 minutes what might have taken hours to discover previously. Even better: it gets smarter over time as it learns about your business and your needs."[40]

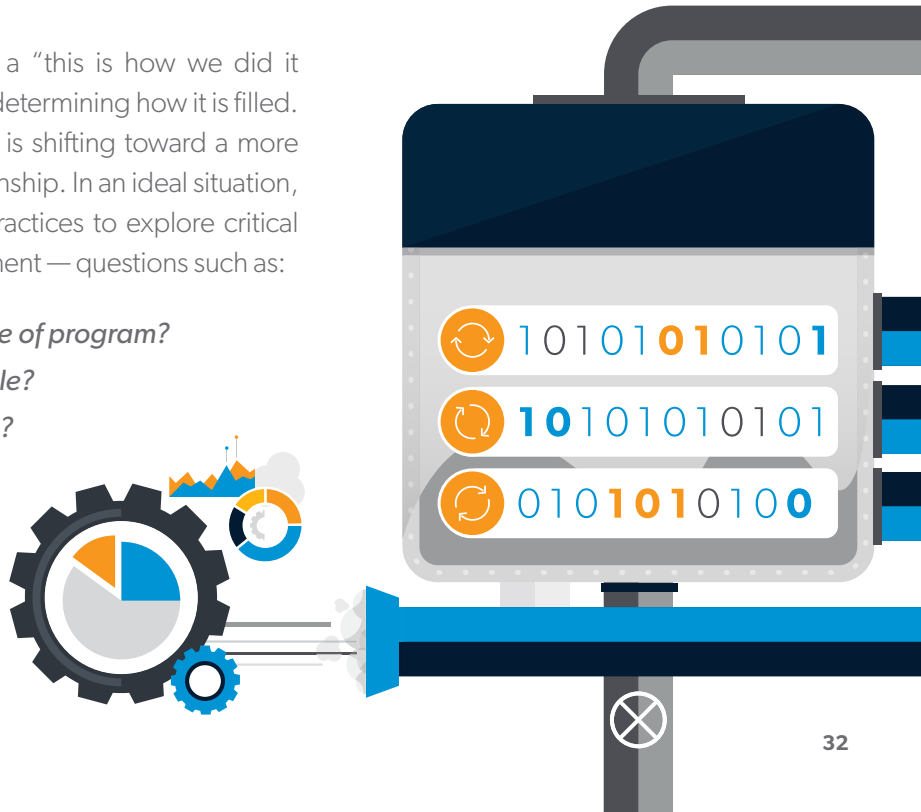
Google's AI innovation focuses on marketing intelligence, but it clearly demonstrates how analytics and AI can deliver intuitive, strategic insight. The same kind of innovation in talent technology will likely influence how companies approach workforce planning in the future.

Job Definition and Qualification

While companies wrestle with complex "big picture" workforce planning issues, the day-to-day operations of the recruiter and hiring manager are also affected by the planning functions of HR. Most visibly, the success of the hiring manager/recruiter relationship hinges on the accuracy and practicality of job definitions and requirements.

In many cases, hiring managers will adopt a "this is how we did it before" strategy for both defining a role and determining how it is filled. Smart companies are building a culture that is shifting toward a more collaborative recruiter/hiring manager relationship. In an ideal situation, that relationship would look beyond past practices to explore critical questions that should shape any job requirement — questions such as:

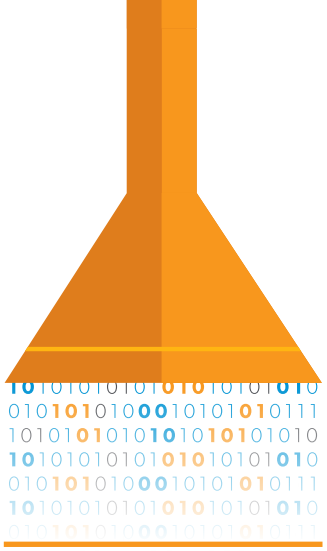
- *What kind of talent is needed for this type of program?*
- *What's a success factor in a particular role?*
- *What will the attrition be for this position?*
- *Who was hired in the past, and how did they perform?*
- *Do the job requirements connect to high performance?*



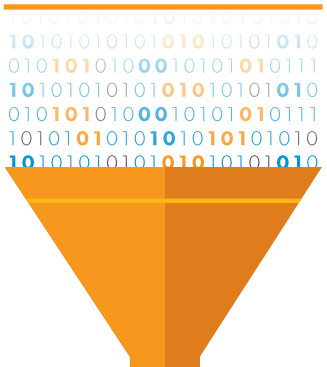
1 Historically, the challenge to asking these questions has been twofold. First, there is human nature. Even with large amounts of data to inform decisions, the answers to the questions would likely be biased toward "what worked in the past." Second, the sheer volume of available data has made research in answering the questions a daunting task.

AI solutions will evolve to address these obstacles. First, AI can focus on comparing current needs to historical data, such as past job requirements, hires, and subsequent performance. With this analysis, an AI program can learn from its calculations to provide meaningful insight to determine what works, what doesn't, and how to make adjustments.

For example, a company may decide that it is looking for a high-performing engineer who worked at Google. If a hiring manager can apply an AI function that drills down and sees the résumés that draw their attention, the filters they apply, and the people they interview and hire, the profiles may look different than their stated predilections. This type of objective analysis removes the human bias, and it helps to answer the questions with clear and objective input.



The planning capabilities of AI will prove essential in a talent marketplace that is growing increasingly complex every day.



2 Second, AI simply makes analysis easier by examining and digesting mass amounts of information in a fraction of the time required by humans. The result? Hiring managers and recruiters approach a requisition based on what they "know" from the machine analysis instead of what they "think" based on their experience. Together, the benefits of objective analysis and quick generation of relevant insights will give AI a significant advantage in better defining requirements and improving hiring speed and quality.

Whether an organization is involved in predicting talent needs for the next five years or simply optimizing requirements for a current opening, AI is poised to make a positive impact on planning. New applications may be made available through standalone solutions or through added AI features in existing platforms. In either case, the planning capabilities of AI will prove essential in a talent marketplace that is growing increasingly complex every day.

TALENT ACQUISITION: SMART TECHNOLOGY, EFFICIENT PROCESSES, ENABLED PEOPLE

Moving from the planning mode and into the active recruiting process, the HR challenge of "knowing" is joined by an even larger challenge of "doing." Today, the sheer volume of activity involved in talent acquisition overwhelms many organizations.

Historically, most organizations judged recruiting performance based on the idea that the faster and more efficiently a company could funnel a large number of initial candidates through a sifting process to reach a finalist and make the hire, the better the outcome. This approach was the general "candidate funnel" mentality. Toward that end, advances in technology have helped to boost speed and efficiency for tasks such as sourcing talent, reviewing résumés, screening, and scheduling.

Today, however, organizations recognize that speed and efficiency do not guarantee success, and moving candidates quickly through a funnel can still yield poor hires or leave many candidates in the dark. Companies cannot afford a reputation for poor treatment of current or potential employees, so the candidate experience is important. Likewise, the cost of

TALENT STRATEGY PERSPECTIVE:

HR Professionals Take Stock of AI

In early 2017, Allegis Group surveyed more than 300 HR professionals, senior manager-level and above, and found that opinions of AI are split between anxiety and excitement.

(Top replies are shown, so total percentages do not add to 100%.)

How do you feel about AI and its impact on the future of work?

- AI will dominate and obliterate mankind 8%
- AI will displace most jobs in 10 years 9%
- AI is both disrupting and enabling 17%
- Machines will replace tasks, not jobs 20%
- We are not adopting AI fast enough 8%
- I'm excited. Bring it on! 21%

What areas of talent management will benefit most from AI?

- Training talent 26%
- Screening talent 24%
- Workforce planning 22%

What types of technologies have you adopted to modernize HR and recruiting?

- Cloud services 27%
- Mobile applications 22%
- Business intelligence applications 14%
- Machine learning AI 12%

Roadblocks to AI adoption

- Budget to upgrade or maintain AI 32%
- Lack of people to build or manage it 26%
- Training the AI 24%

Skills cited as susceptible to automation

- Data collection/processing 36%
- Predictable physical work 27%
- Analytical/quantitative skills 23%
- Customer services/administration 22%

a poor hire, from an inability to perform the job to the negative impact on other employees, is seen as a significant liability. With that in mind, recruiting must also be smart. That's where AI comes in.

At its core, smart talent acquisition requires data intelligence and human communication capability. Nearly every interaction in the recruiting process involves communication with people or the use of data that is either unstructured or inconsistently structured. AI is suited to address these issues, offering the potential for near-human communication combined with the broad analysis function that can automate and boost intelligence throughout the talent acquisition function. As a result, AI developers are beginning to address many challenges and needs.

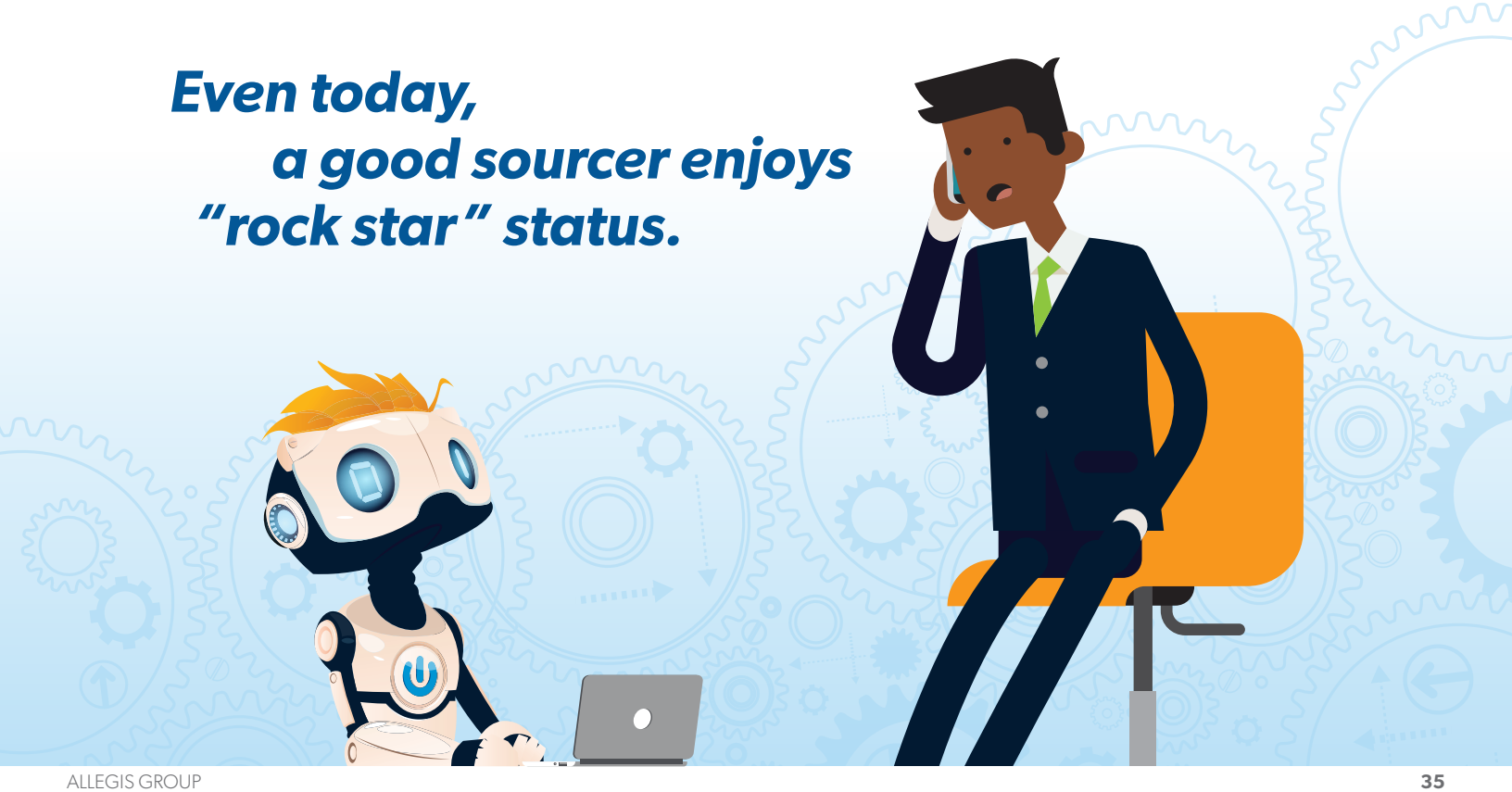
Sourcing: Replicating the Rock Star?

The ability to consistently find strong candidates remains elusive. For roles with high-demand skills, sourcers have few active candidates to attract through traditional job boards. The majority of the talent pool often consists of the much desired "passive candidates," workers who are employed but would consider opportunities if approached in the right way.

Great sourcers can find and analyze data, particularly information generated online and through social media, and pinpoint passive candidates who may be right for the job. They can also dig up details to help "sell" the opportunity to passive candidates. For example, did a candidate complain about moving to a location for their current job on Facebook? A good sourcer may dig that information up and use his or her company's location as a selling point against the current job. All of this sleuthing takes time, hard work, and intuition. Even today, a good sourcer enjoys "rock star" status.

The challenge for a talent organization is that sourcing rock stars are difficult to replicate. Great training and a strong learning culture across the profession — combined with

Even today, a good sourcer enjoys "rock star" status.



sophisticated tools and access to data — are raising the bar on sourcing excellence. Nevertheless, research takes time and intuition. AI addresses this challenge with new advances in sourcing, including services that combine a human interface with a powerful search capability that leads sourcers to strong candidates.

One notable innovation is HiringSolved and its recruiting artificial intelligence (RAI) tool. The solution aggregates billions of social profiles and data from the web, and it applies advanced machine learning algorithms to search that data based on the sourcer "conversation." The application asks questions about the job and the requirements, and, in many ways, resembles the same conversation that a sourcer would have with a hiring manager. The goal of the technology is to become the "Siri for recruiting."

By taking on some of the research aspects of sourcing, new AI tools will free sourcers to identify quality talent quickly and effectively. AI may not fully replace the rock star sourcer, but it will raise the overall quality and consistency of results, giving adopters a critical advantage in competing for talent.

Candidate Matching and Résumé Screening: Speed, Accuracy, Bias-Avoidance

Screening résumés, and the effort to identify and match potential candidates to job requirements, remains one of the most daunting, low-value activities in talent acquisition, and it is ripe for automation. In fact, one study found that recruiters spend an average of six seconds of screening time per résumé, and more than 75% of received résumés are unqualified.[41]

Much of the problem stems from the fact that most candidate data is unstructured. Machine learning-based predictive analytics using natural language will address unstructured data to allow candidate matching faster and with fewer mistakes. Imagine a world where companies can qualify candidates by having them interact with a chatbot or AI tool, answering common candidate questions about the role while also asking for feedback and information about the candidate. Compared to approximately 10 résumés per minute, an AI can potentially process thousands of résumés in the same timeframe, effectively removing initial screening time from the recruiting process.

75%
of received résumés are unqualified.

AVERAGE TIME RECRUITERS SPEND SCREENING A RÉSUMÉ

In addition to screening a larger number of candidates, advanced programs today are also taking into account more detailed information. This deeper analysis gives each candidate a chance to be considered on terms other than job titles, company names, and start and end dates. In addition to improving screening speed and intelligence, AI applications are also notable for their objective analysis capability. An AI solution can not only help remove bias in candidate selection but also help organizations avoid the unconscious bias that often taints the development of job descriptions and requirements.

Candidate Care: Engagement, Communication, and Scheduling

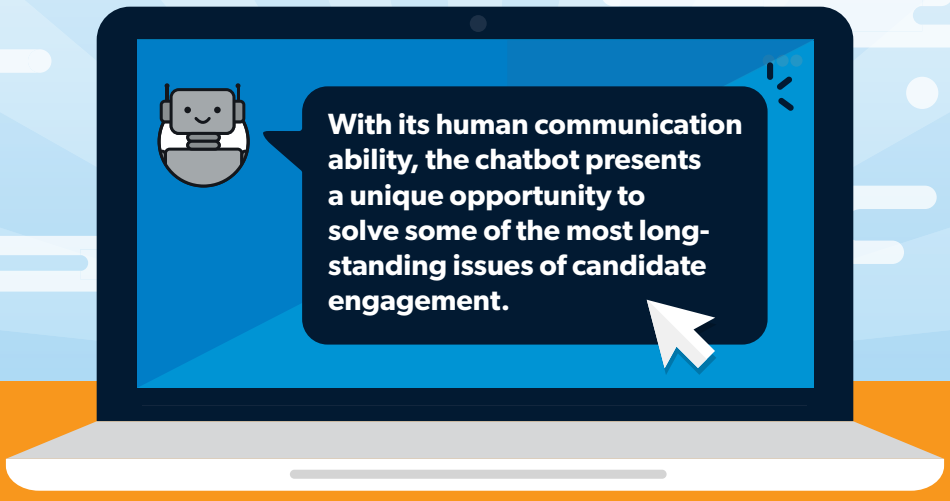
The human face of AI today is the chatbot. It is the function that "talks" with the recruiter in defining job requirements and recommending candidates, and it can be a primary point of communication to candidates themselves. With its human communication ability, the chatbot presents a unique opportunity to solve some of the most long-standing issues of candidate engagement.

Wade and Wendy, as described earlier, is representative of early-stage, AI-driven chatbots. In this example, a virtual career guide (Wade) or virtual hiring assistant (Wendy) can ask and answer questions with prospective candidates in a dynamic and intelligent fashion. This function can play an active role in bringing more candidates into the process and move them along toward selection without requiring recruiter interaction.

In addition to intelligent conversations with the candidate, AI assistants can also automate the high volume of administrative interaction, providing automatic, real-time, unique reminders and messages that are often neglected by human recruiters. One example is scheduling. Alex, an assistant developed by AI developer, MyAlly, is touted as "a blend of AI, traditional software and human supervision." The solution coordinates and understands email threads from multiple parties, understands context, and takes action as needed. As a result, companies have a solution for booking interviews or coordinating colleagues, teams, and candidates while eliminating the wasted time and email traffic associated with scheduling.

By maintaining candidate contact through even the simplest interactions, AI services can eliminate the "black hole" of non-communication that often loses candidates or creates a poor reputation for the company. Whether scheduling through MyAlly or guiding candidates through Wade and Wendy, AI applications are already beginning to offer practical solutions for candidate care.

These solutions represent just a few of the ways that AI is changing talent acquisition. Today, most developments are aimed at solving specific issues in the life of the recruiter, the candidate, and the hiring manager. As the technology matures, the real impact of AI will be felt as the roles of recruiters and sourcers are transformed into more strategic functions and freed of repetitious review and communications tasks. The effect will be to raise the standards in competing for talent. The need for humans will not disappear. Instead, look for human skills to be more crucial than ever as the role of the recruiter shifts from an administrative guide to become a more strategic partner to the candidate and the business.



POST-HIRE ENGAGEMENT AND WORKFORCE MANAGEMENT: REINFORCING EMPLOYEE VALUE

Much of the job of talent acquisition is about establishing a relationship between a company and an employee. Once the offer is made and the candidate accepts, a new journey begins — one that focuses on fulfilling an initial promise of value and growing it over time. It's about employee engagement, performance management, skills development, and a host of related time- and resource-intensive functions. Moving forward, AI will provide a significant advantage in helping companies to better understand and engage with their workers. AI's impact will be felt across key areas of employee experience.

Post-Offer Acceptance and New Hire Onboarding

Once a candidate accepts a job offer, an AI could engage and follow up with the candidate to accelerate acceptance and reduce the gap between hiring decision and start date. Following the hire, a candidate undergoes onboarding and orientation. While orientation introduces new hires to company culture, processes, and policies, an AI can fill in the gaps by answering common questions and providing information and resources. Considering that 90% of employees forget what was covered in a meeting, training, and conference calls,[42] the information and learning reinforcement of AI can prove valuable.

Re-Engagement

Maintaining contact with past candidates can help an organization improve its future talent supply; unfortunately, candidates' records often go untouched after the job requisition closes. AI can help address this issue by allowing an organization to re-engage a targeted group of

TALENT STRATEGY PERSPECTIVE:

People Will Always be Essential to a Relationship of Trust

Tanya Axenson
Vice President of Human Resources, Allegis Group

"When you speak with a person, you trust that she is listening to you, learning from you, and sharing with you out of some level of genuine interest. But **will you fully trust a machine designed to calculate everything you say toward making a decision? Probably not. That's why people will remain essential to the high-trust aspects of HR** — closing deals, solving tough employee issues, building relationships, and creating the organizational strategy."

candidates to determine their interest in a role while also using the engagement opportunity to keep abreast of new skills or experience the candidate may acquire. By automating this process, AI can remain in contact with past candidates and maintain a potentially valuable portion of the future talent pool.

Skills Development

Training can be a key to employee value and retention. Unfortunately, many organizations take a passive approach to administering their programs. A curriculum and resources may be available, but it is often up to the employee to decide whether to use those learning resources.

Machine learning computer algorithms could "learn and recommend" when it comes to employee training, helping to understand the employee and push skills development opportunities in a way that is relevant and compelling. This improved communication can lead to higher participation in learning programs, improved return on training investment, and, most importantly, a workforce with growing skills.

Career Development

Employees have questions and need support. They may need customized training, learning, and career path information that a boss or leader can't provide. Along with advanced training and skills development guidance, AI offers the ability to facilitate a more holistic career development, mentorship, and company coaching program.

Employee Relations

Some employee questions are simple (e.g., benefits, vacation, and pay) while others are complex and require an in-depth conversation with an HR manager or coordinator. AI technology can be used in chat form, email, or a virtual meeting room, answering many questions, understanding the issue, and, if needed, booking a meeting between HR generalists and employees. Automating this activity can significantly reduce a time-consuming communications burden and allow HR to focus on critical employee interactions.

HR Compliance and Case Management

Many case management software solutions provide employees with resources and information based on the questions they send to an email inbox. After that submission, if the resources and information are not clear or helpful, HR and legal resources may become involved in answering those questions.

AI opens the door to more advanced functions where incidents are documented and employee investigations are submitted with an automated assistant tool. The tool would ask a series of questions and gather information when a complaint is registered, helping to reduce the need for expensive human interaction early in the case management process.

Attrition Mitigation

AI can quickly identify factors affecting high staff turnover. For example, a company's current pay scale may match the market, but if it veers toward the lower end, the business risks losing talent to competitors. Historical data might also reveal who out of a group of candidates is most likely to remain in the position for the longest time.

These areas of workforce management represent a taste of the challenges and opportunities that AI is poised to address as new solutions enter

the market. As with previous waves of innovation, an initial flurry of standalone, niche applications may be followed by increased adoption within larger solutions. If the history of enterprise systems, applicant tracking systems, recruitment marketing, and related technologies are any indication, the pace of change may vary, but the strategic value will continue to grow as AI applications begin to span the multiple functions of HR, from recruiting to compensation and performance management.

TALENT IMPLICATIONS, ETHICS, AND THE FORCES OF CHANGE

The examples of innovations so far show that most solutions are aimed at solving specific challenges in talent management, but on the whole, AI is not limited to a single function. As AI evolves to work across the silos of talent, the solutions will likely grow more impressive.

Imagine a recruiter speaking into a mobile device and saying, "Cortana, I need a data engineer with SQL skills." What if the program asked more questions about the type of person needed for the job, then looked into its database, found the right person, scheduled an interview, facilitated the selection process, oversaw onboarding, and managed that person's payroll, benefits, and skills development program? That's a powerful capability, and it's one that the larger players in the space are reaching to achieve. The vision is likely part of the reason Microsoft recently acquired LinkedIn.

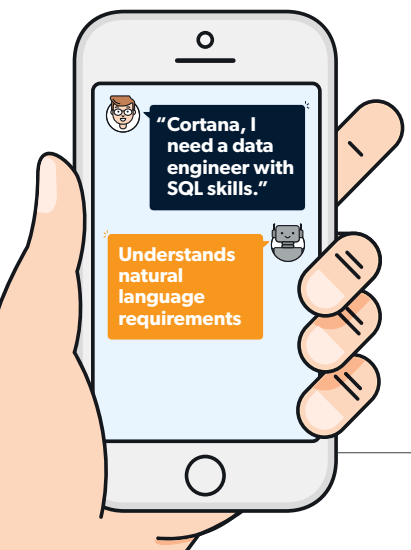
TALENT STRATEGY PERSPECTIVE:

Consider AI as an Option Across all Talent Functions

Rachel Russell
Executive Director, Corporate Strategy & Marketing, Allegis Group

"A variety of niche solutions based on AI technologies are beginning to come to market. Each solution may address a different need, whether in sourcing, learning and development, candidate care, or any other talent function. **The organization that is best able to adopt different solutions and connect the dots across the talent management function is likely to enjoy an advantage in competing for talent** as the technology matures."

Along with its powerful promise, AI also poses ethical questions as pointed out by an active player in the AI space, Shon Burton, CEO and founder of HiringSolved. "AI is good for pattern matching and prediction, but is it ethical to predict race, gender, honesty, intelligence, performance, reliability, or culture fit? … Imagine how it might be to have to qualify, negotiate pay or communicate healthcare concerns to an AI-based system who all the while is analyzing your interactions with it and using that information to predict your suitability for the role or the lowest salary you are likely to accept."[43]



While the concerns are real, they also highlight another fact about AI and talent. That is, HR depends on humans to do the most important parts of its function, interacting with candidates and employees, finding talent, determining strategy, and evolving with the business. Innovations in technology will not only help HR do its job better, but they will change what that job is. More than ever, a static, process-driven approach to talent will be replaced by a focus on strategic vision and agility.

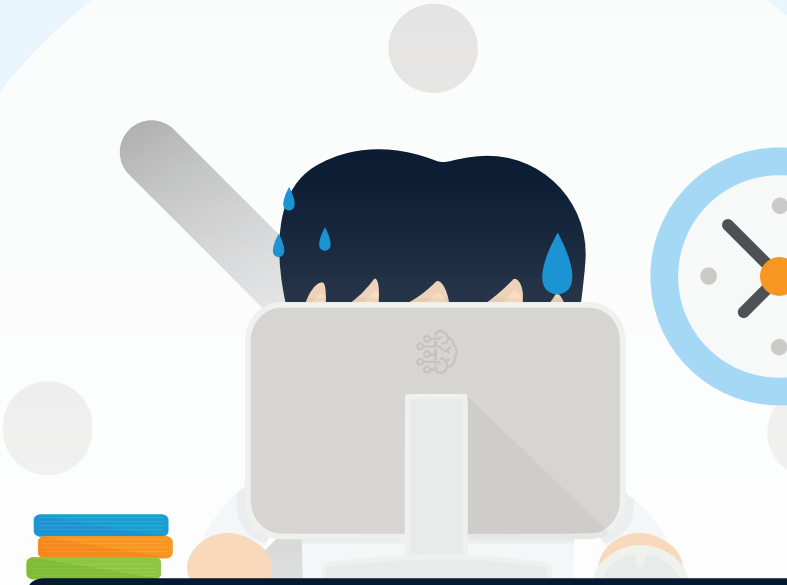
CONCLUSION:

*A **Future** That Will* TRANSFORM TALENT

AI is here. Machines can think on their own. They can win at chess, and they can change the way companies engage with people who drive their success. No confluence of innovative forces in history has come so close to replicating the capabilities of the human worker in both thought and action. Machines are still a long way from making people obsolete, but the technology is making its way into all parts of life. At some point, every individual and every business will encounter an AI-related choice.

Talent leaders may find themselves considering an AI sourcing solution as a way to help beat competitors to the talent. A traveler may find her request for a taxi answered as an AI-powered driverless car pulls up to the curb. In some future election, voters may find themselves considering a proposed law placing restrictions on AI. These are just a few of the encounters that are around the corner. So, when it comes to workforce and talent innovation, how should companies treat this trend?

When an organization is involved in planning for workforce needs, establishing strategies, considering technologies, or simply having a conversation about the future, AI needs to be part of the discussion. Business leaders need to consider the workforce tasks that make up their processes today. Is there a possibility that those activities will be automated? If so, how will the business benefit, how will it re-focus, and how quickly can the company make changes happen? Organizations would do well to engage with partners who are using or exploring AI technologies today, and they must keep an eye on the competition.



TALENT STRATEGY PERSPECTIVE:

Don't Wait on Innovation

Neil Cains
Innovation Lab Director, Allegis Group

"Every talent decision maker has a full plate, and it's tempting to ignore the market and wait until next year's budget to consider innovations, new technologies, and solutions in areas such as AI. In today's market, waiting is a risk. **Whether you are a talent partner working as an advisor to your clients or an internal talent expert for the business, an 'eyes open' approach to AI innovation is essential.**"

Above all, talent leaders can no longer afford to ignore the trends or wait to be told what to do because regardless of the pace of change, success, or setbacks, the technologies of AI are now real-world forces, and they are here to stay.

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