

# What Artificial Intelligence Means for Human Resources

# TABLE OF CONTENTS

## **Executive Summary . . . . . 3**

HR is mostly in the dark about what AI is, yet the technology is rapidly being integrated into workforce applications.

## **Today's AI Landscape . . . . . 5**

Artificial intelligence has gone from science fiction to reality in little more than a decade. Now, vendors are jumping on the AI bandwagon and much of it is hype.

### **An AI Agent In Action . . . . . 7**

This bot searches through thousands of documents and videos to come up with answers to tough questions.

### **How AI Will Change HR . . . . . 9**

When AI takes on all the transactional work, what will happen to HR?

## **What is AI? . . . . . 10**

Everyone is talking about artificial intelligence, but what is it? This section will help you navigate among the various interpretations.

### **What Are They Saying? . . . . . 10**

AI terminology defined.

## **AI-Powered HR Applications . . . 14**

A review of the AI technology available and in use now and a look at AI applications that will be coming soon.

### **Before You Buy AI . . . . . 15**

What you need to consider before investing in AI applications.

### **4 Sins of HR Vendors . . . . . 18**

Separating the claims from what is real.

## **Into the Future . . . . . 26**

AI technology grows more sophisticated almost daily. This section looks at the future of AI-enabled applications and automation, not just on HR, but on the workforce generally.

### **What to Do Now . . . . . 28**

Here are the 6 steps to take now to be ready to harness the power of AI.

### **Analyze Your Existing Skills . . . . . 29**

Ask these questions to see if you're AI ready.

## **Contributors . . . . . 30**

#### ABOUT THIS REPORT

This Research Report was produced by [TLNT.com](http://TLNT.com), a property of ERE Media which retains all rights. No portion of this report may be reproduced without the express written permission of ERE Media.

Produced by John Zappe, editor / TLNT. Design and layout by [Jennifer Shick](#).

Comments and inquiries may be sent to John Zappe at [John@TLNT.com](mailto:John@TLNT.com). Visit [TLNT](http://TLNT.com).



# EXECUTIVE SUMMARY

## This report examines the growing role of artificial intelligence in human resources.

A primary focus of the report is to provide HR leaders with a substantive grounding in the issue to enable them to make good decisions on technology selection and implementation. The goal is pragmatic: Help HR leaders understand what AI is and how it is making a difference in human resources technology specifically and talent management broadly.

We draw upon a broad array of reports, research, interviews and data to present a meta-analysis of the current state of AI-enabled HR and workforce tools and sentiment. As part of this discussion, the report provides guidance on the directional trajectory of AI development and its implications for the future of the HR function.

### Key Highlights:

- ▶ HR professionals generally have a limited understanding of AI. A survey of 1,000 HR professionals found only 14% strongly agreeing they are knowledgeable about the use of AI in human resources. Another 29% moderately agreed with that, leaving the majority admitting they are still mostly in the dark.
- ▶ Technology vendors are more likely to confuse the issue than bring clarity. While new HR technology startups – and most established vendors – claim to have incorporated AI, the promises are frequently overblown, and the explanations are usually poor.

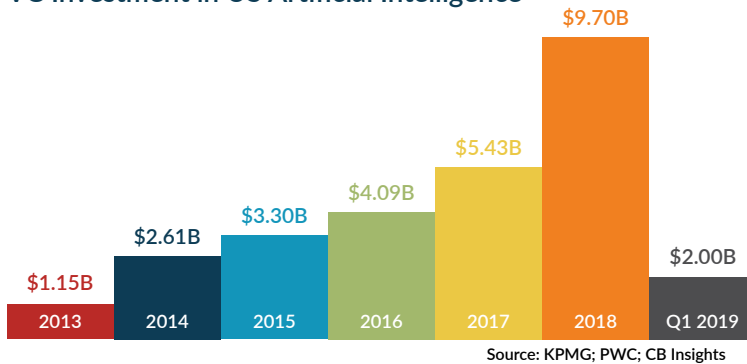
- ▶ Meanwhile, investment in HR internet technology has exploded. Though investment in non-internet / non-mobile (think on-premises) workforce management tools continues to chug along, investment in SaaS, mobile and internet-based HR technology has increased 6x in the last 10 years. Much of this investment is fueled by the dramatic increase in VC and equity-funding of AI worldwide.
- ▶ Today, the most common use of AI in HR is for talent acquisition. Resume screening and chatbot candidate interactions are the most common areas of talent acquisition where AI is deployed. More dramatically, AI is showing promise in its ability to assess competencies and potentially fit from a video interview.
- ▶ AI is rapidly broadening its reach into other areas of HR and talent management. For engagement, AI can assess the comments on a survey and summarize the themes. Some vendors are experimenting with sentiment analysis from employee messaging conversations. For learning, AI is being used to analyze skills assessments and recommend relevant training. It is also able to track licensing requirements and alert employees and managers to required training. For compensation, AI can suggest appropriate increases based on more factors than a manager is likely to consider on their own.
- ▶ The biggest obstacle to AI deployment is data quality. Even sophisticated HR operations have data scattered in multiple locations. Cloud-based data warehousing is centralizing this data, but does little to help integrate it to make it usable for the kind of valuable analytics that AI-based programs can perform. AI depends on large volumes of accurate data; in many cases, HR does not have this data and when it does, it needs to be “cleaned” to make it useful.
- ▶ An important obstacle to more rapid adoption and reliance on AI is concern over bias. This has emerged in talent acquisition where AI-enabled technology ranks candidates on both qualifications and their potential for success. The predictive analytics relies on the data inputs, which incorporate whatever unconscious bias informed candidate selection in the past. Vendors are increasingly sensitive to this issue, but HR practitioners must understand the technology well enough to be confident that the vendor genuinely has dealt with possible bias. Likewise, they need to examine their own data carefully to avoid inadvertently introducing bias.

# TODAY'S AI LANDSCAPE

AI has rushed into business with breathtaking speed and human resources is benefiting from the AI “gold rush,” as [Gartner](#) described it.

Last year, VCs and investors poured \$9.7 billion into U.S. startups in AI, an almost 80% increase over 2017. Meanwhile, investment in internet-based HR and workforce management tools saw an 87% increase from 2017 to 2018. And as a Talent Tech Labs [survey reports](#), most HR startups and investor-funded firms claim to be AI-based.

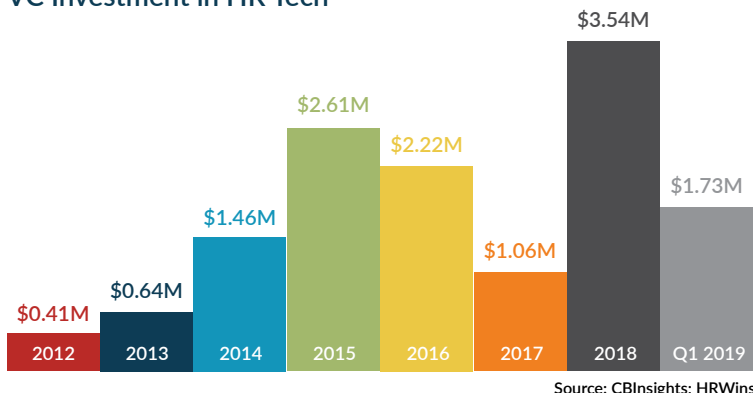
VC Investment in US Artificial Intelligence



[Research by PwC](#) suggests that 40% of the HR departments of international companies are already employing some form of AI application. And that was in late 2017.

By 2018, Deloitte was reporting in its [Global Human Capital Trends Report](#) that 42% of the respondents in its annual survey believe AI will be widely deployed at their organizations within three to five years. IBM's report on [The Business Case for AI in HR](#) says, “IBM HR's experience is that AI can be applied in almost any area of HR, including candidate attraction, hiring, learning, compensation, career management, and HR support.”

VC Investment in HR Tech



Within organizations, HR is on the verge of seeing the rapid encroachment of AI. David Millner, founder of [HR Curator Ltd](#), notes that in 2016, IBM's HR function didn't use any chatbots and now, according to [MIT Sloan Management Review](#) they are using 15 chatbots.

Surprising for as fast as AI applications are being adopted, business has only a limited understanding of the fundamentals of artificial intelligence. A [2017 Deloitte survey](#) of 1,500 senior executives found only 17% familiar with both the concept of AI and its applications at their companies.

Human resources professionals fare even worse. A current survey by [HR.com](#) found only 14% of HR "strongly agree" they are "knowledgeable about the topic of using artificial technology for the purposes of enhancing the human resources function." A majority of respondents to the survey admitted to knowing little or nothing about the topic.

Yet, while only 10% of respondents to the HR.com survey reported using AI to a high or very high degree today, 46% expect to do so by 2023.

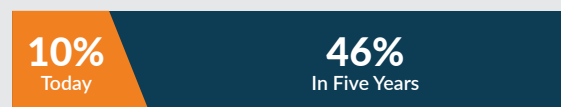
### AI in HR Survey Results

Source: The Current and Future State of AI in HR / HR.com

I consider myself knowledgeable about the topic of using artificial technology for the purpose of enhancing the human resources function.



For HR purposes, to what degree is your organization making use of AI today, and to what degree do you think it will be in five years?



Rory O'Doherty, incubation operations manager at Talent Tech Labs, says their [survey on talent acquisition technology](#) startup in Q3 and Q4 of 2018 showed 75% of startups claiming to have AI. O'Doherty is quick to add that Talent Tech Lab's research has shown that most of those claims are shallow (i.e. the application of AI was insignificant) or wrong (e.g. the product used intelligent workflow, not true AI).

This means that, from now on, most of the technologies HR needs to evaluate will claim to have AI. It also means that HR needs to be sufficiently skilled to separate the wheat from the all too prevalent chaff.



## AI Hype

With so much interest in HR AI technology, HR professionals may turn to their vendors for education. Unfortunately, technology vendors are not helping. While most new HR technology startups claim to have AI, the promises are frequently overblown, and the explanations are usually poor.

[Gartner called it](#) the “biggest gold rush in recent years.” “Similar to greenwashing, in which companies exaggerate the environmental-friendliness of their products or practices for business benefit, many technology vendors are now ‘AI washing’ by applying the AI label a little too indiscriminately,” according to Gartner.

HR needs to learn to deploy this new technology where it adds value without getting sidetracked by false promises or immature products.

The most common use of AI in HR right now is for talent acquisition. AI can do a good job of screening resumes for high volume jobs. It’s a good task for AI because it’s repetitive, tedious, and typically not done well by humans. More dramatically, AI has some ability to assess competencies from a video interview and does so far more cheaply than a human could. There are also AI chatbots which can answer candidate questions about the company or ask them for information missing from their resume.

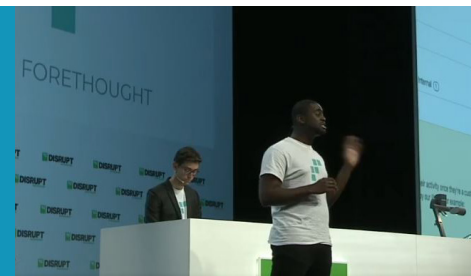
For engagement, AI can assess the comments on a survey and summarize the themes. For learning, AI can recommend courses much as Netflix recommends movies. For compensation, AI can suggest appropriate increases based on more factors than a manager is likely to consider on their own. It’s getting to the point that asking what AI can do in HR is a bit like asking what technology can do; it is a set of general-purpose tools that have many different applications.

## An AI Agent In Action

Forethought won the 2018 Techcrunch Startup Battlefield at Disrupt SF. The company’s first application is an agent to provide answers to customer service staff by intelligently searching through all kinds of data within the company, including videos, that might provide an answer to a query.

The intelligent assistant has enough reading comprehension that it can pull out the specific information the service representative needs. It’s the difference between seeking information by flipping through a manual and having someone just tell you the answer.

This case is interesting because here AI is reviewing massive numbers of documents and videos with a useful degree of comprehension. That’s a broad skill set and even if one isn’t certain about the specific use cases in your organization it’s clear it will have the same kind of broad impact that moving data from paper to online did.



## Controversies

The biggest controversies around AI are in its potential to be biased and the “creepiness factor.” Vendors are well aware that AI can be biased in screening or assessing candidates; many take pains to minimize bias, though eliminating it entirely is as yet, elusive. HR will need to understand the technology well enough to be confident that the vendor genuinely has dealt with possible bias.

The creepiness factor arises from AI doing things that employees feel invades their privacy. For example, an AI application can assess personality traits from blogs people have posted online. At least one vendor is analyzing facial expressions in video interviews for clues to cultural fit.

---

**Vendor promises are frequently overblown and the explanations are usually poor.**

---

Many people are discomfited by these developments, feeling uneasy about a machine “analyzing them.”

While the controversies grab attention, the more practical issues flow from the limitations of existing AI applications. AI depends on large volumes of accurate data; in many cases, HR does not have this data. Even where the data exists, the AI solution may be only a little bit better than more traditional tools; not a revolutionary leap forward.

The immediate impact of AI on HR will be tools that make the function more efficient. Indeed, some of the very HR tools we discuss in this report have significant disruptive potential. Chatbots may not yet be ready to replace an HR generalist or handle the broad range of inquiries received at a service center, but they are sufficiently sophisticated to manage the more routine issues, freeing staff to perform higher value work.





## How AI Will Change HR

Although beyond the scope of this report, we would be remiss not to mention the implications of AI and AI-enabled automation on the workforce generally. The longer-term and larger impact of AI will be on the business and the nature of the HR function itself. Over the next decades AI and automation are forecast to eliminate roughly half the tasks humans currently do. This means workers will need to be retrained, upskilled and/or reassigned. Inevitably, some will be permanently displaced.

These issues are amply discussed in multiple reports by a broad variety of organizations including the World Economic Forum, Deloitte and the World Bank.



However, we believe the timelines are shorter than some predict. AI has been advancing faster than many expected. Investment in artificial intelligence applications is accelerating rapidly. Venture capitalists are increasingly funding HR and workforce management development.

Considered in a single light, this means we risk underestimating AI's impact in the near-term. Within the HR function, the amount of transactional work will be greatly reduced – potentially sooner than many expect – leaving HR to find new ways to add value or else end up with a much, much smaller responsibility.

HR should be rapidly building its capability to successfully deploy AI tools. To build that capability we recommend HR departments begin hiring AI-savvy professionals and encourage awareness, if not expertise, amongst the current staff. HR's understanding of AI needs to accelerate dramatically in the next few years as they begin experimenting with AI technologies.

Meanwhile, HR leaders must plan for the disruption AI will have on their workforce. With HR itself in the vanguard – where AI is already having an impact – introducing more advanced AI functionality to your HR processes may serve as a sort of “pilot” for organizational implementation. As you weigh the potential effects of AI, and as you read through this report, the questions you need to consider are these:



- How AI will change jobs and what that does to organization design, compensation, and training.
- How AI affects the mix of talent you need to hire or develop.
- How to manage employee resistance to AI.
- Whether AI will lead to significant layoffs in some part of the business.

In any disruption, HR's role in helping the business adapt will be more important than managing the disruption's impact on HR processes.

# WHAT IS AI?

## What Are They Saying?

### Neural Networks

The most important approach to AI is inspired by how the human brain works.

A neural network is a large number of “digital neurons” that are connected to one another roughly the same way biological neurons are connected in a brain. Information (such as an image) is input into the network of neurons and it creates an output (such as the conclusion, “That is a cat”). The output is then scored as true or false. The connections that lead to correct answers are strengthened and those leading to wrong answers are weakened.

If given enough examples, the neural network can get good at the given task (e.g. identifying which pictures have a cat in them). The curious thing about neural networks is that the programmers don’t know how AI is coming up with the answer; they do not program it to “look for two eyes” or “look for a tail”; they simply show it examples and it learns on its own.

### Deep Learning

Early neural networks were quite simple and couldn’t do many useful tasks. Newer neural networks that contain more layers of neurons have proved to be far more powerful. A particular design of these more advanced neural networks is called “deep learning.” Deep learning neural nets led to the breakthrough in AI’s ability to recognize images and words and to master complex games like the Chinese game of strategy, Go. Considered the most complex game in the world, an AI-powered computer [beat the world’s best Go champion](#) in 2017.

The most pragmatic definition of AI is that it is any tool that simulates human intelligence in performing a task that previously only a person could do. What this means is that tasks which were slow or expensive or even outright impractical in

the recent past, may be practical now because they are done by a machine rather than a human. For example, [AI can look at a video of someone going through a structured interview](#) and help assess their suitability for the job, much like a trained psychologist. That was unimaginable just a few years ago. More prosaically, AI can give employees personalized suggestions on relevant training, which is more convenient than having to look through a listing of available courses.

## What Are They Saying?

### Machine Learning

Machine learning refers to any program that allows a computer to look at input data (resumes) and output data (retention) and learn from that data on its own. For example, it could learn to predict, based on their resume, which people are likely to be stay with the company a long time. As the AI gets more data over time it continues to learn and gets better at the task. Most machine learning is done with neural networks.

### Natural Language Processing (NLP)

This is a collection of tools that allow computers to convert speech to text and understand (within limits) the meaning of speech or text. This ability to understand speech has become an everyday feature in Alexa, Google Assistant and Siri.

### Pattern Matching

A computer can recognize images or find patterns in data. "Pattern matching" is a phrase people use to explain what is going on in machine learning. The operation of a neural network is very technical, however if we imagine that the computer is looking for patterns or learning to recognize patterns, then that is easier to comprehend.

There is a useful distinction between AI (which exists) and AGI (which does not). AGI stands for Artificial General Intelligence. It refers to a flexible intelligence that is similar to a human's. Current AI tools can excel at a narrow set of tasks, but have no common sense, no general understanding of the world, cannot easily learn from limited experience nor do multiple unrelated tasks.

Experts expect that human-like AGI will come one day, but whether that is in 25 years or 250 years is at best sci-fi speculation.

Overall, the easiest way to think about AI is that it's a tool that enables technology to do more things.

---

**Any tool that can do something that previously could only be done by human intelligence.**

---

## Why AI matters to HR

Is AI important? Is it underestimated?

AI is en route to becoming one of the most stunning inventions humans have made, ranking right alongside writing and the wheel. That said, it's also true that today it is over hyped. Don't let the hype squash your enthusiasm; there are two good reasons why HR leaders should be paying attention to AI right now:

## 1 HR tools that use AI are available today. They can do practical work.

The tools available now include resume screening, chatbots, and analytics. However, all AI-enabled HR technology is quite new. Many offerings are immature, but good enough to save you time and money today.

## 2 AI has been advancing faster than many expected, and this means we risk underestimating its impact in the near term.

In 2017, the AI [AlphaGo](#) beat the world champion at Go. In 2018, [Waymo's autonomous cars](#) had already driven 8 million miles. In 2019, the AI [AlphaStar](#) beat professional players of StarCraft II, a game that involves both real time battles and strategic planning. As consumers we now take for granted the ability to speak to Alexa or Google Assistant or Google Translate. HR leaders should get involved with AI now because organizations can use real applications that already add value while simultaneously preparing themselves for important new applications that may be upon us faster than we expect.

While there are AI applications that are ready now, HR leaders should be healthy skeptics. They should demand transparency about how the AI actually works. If a vendor makes a claim like “matched with 98% accuracy” then the HR leader should ask to see how that number is calculated and the evidence on which that number is based (or more precisely, they should get one of their analysts to hear and test that explanation).

### What Are They Saying?

#### Semantic Analysis

A particularly useful application of NLP in HR is to read through the comments in an employee survey or on social media and summarize the themes. Today's AI can understand enough about a word or phrase in the context of a sentence to make a good guess of the meaning. Sometimes this is called “sentiment” analysis because some of the first uses of this tool was to report on moods (i.e. Are employees happy? Are they angry?).

#### Robotic Process Automation (RPA) / Intelligent Workflow

[RPA or “Intelligent Workflow”](#) is any fairly sophisticated program that uses if/then rules to automate a process. This may be referred to as a “decision tree” because if you map out those if/then rules it branches like a tree. RPA is not considered true AI; it can't learn on its own. However, it is still useful in many applications. Often when a vendor claims they have AI, and you dig into what they actually do, you will find it's actually RPA / Intelligent Workflow.



Most important of all is to get a demonstration of AI applications working in practice. In many ways an HR leader doesn't care if the application uses real AI or a simple robotic process automation; if it is better than the current process and is cost effective then it's a good buy.

## HR disruption will be subtle

### The paradox of disruptive technologies

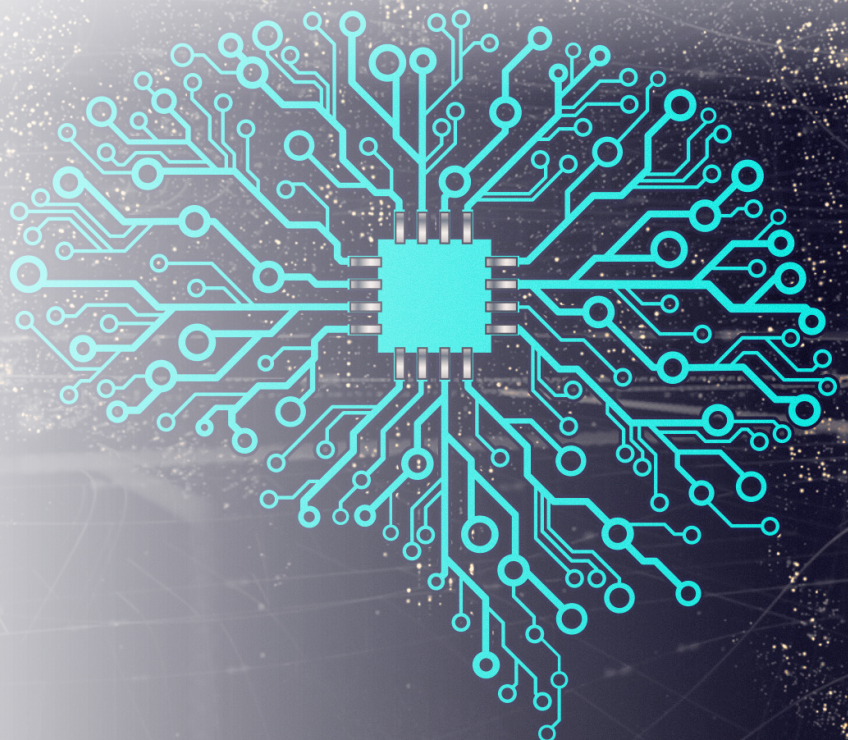
In recent years we've seen two profoundly disruptive technologies: the internet and smartphones. If you were working in a company ravaged by these new technologies (like Borders or Blackberry) this disruption felt very real. For the typical consumer, while we were amazed, the transition was relatively smooth. We can expect AI to be like that for HR. You'll buy an HRMS and it will automatically produce a report on flight risk using AI or you'll buy talent acquisition software and it will have built-in AI that screens resumes. The fact that a piece of software uses AI will in most ways be irrelevant to you; it's simply a feature of the product that does something useful.

The paradox of disruptive technologies is that they can enter your life remarkably smoothly or they can crush your organization. The key for HR leaders is simply to stay sufficiently abreast of the technologies that they are not caught unawares.

---

*Staying abreast will require ongoing attention since the field is evolving at such a hectic pace.*

---



# AI-POWERED HR APPLICATIONS

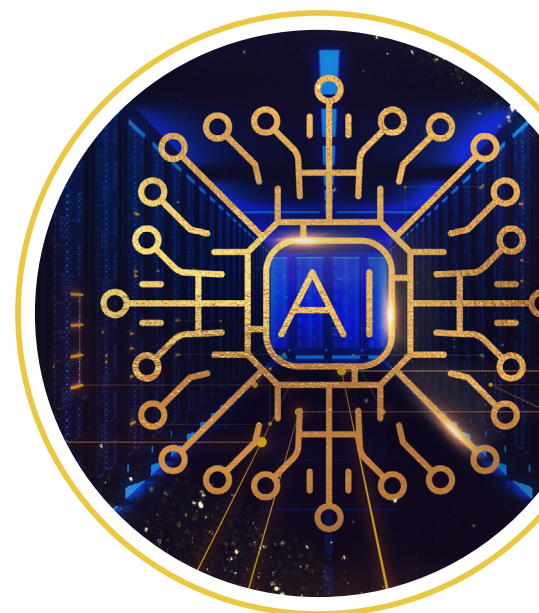
We are already at a point where asking, “What can AI do in HR?” is a little like asking, “What can computers do in HR?” AI is a general-purpose technology and it can play some role in almost any imaginable task. Lucinda Charles-Jones, Group HR Director, AXA UK & Ireland tells us, “AI can be applied to almost any area of HR including candidate attraction, hiring, learning, compensation, career management and HR support.”

Some of the core skills of AI include:

- Finding information (answering candidates’ questions about the company)
- Assessing data (resumes, interviews)
- Doing analysis (looking for clusters in a large data set)
- Making recommendations (which training is relevant)

In many cases, AI solutions offer a small improvement not a massive one. For example, you can provide information about your company to candidates via a traditional FAQ or via an intelligent chatbot. The chatbot is cool, but today may not be much better or cost effective than the FAQ for delivering information.

In this section we take a look at some of the applications that are ready now; but first one word of caution. Vendors don’t fall neatly into categories. They typically have several products that fit into more than one category. Also, two vendors in the same category may approach the problem differently, so though they are tackling the same topic, they are not directly comparable. HR technology is not a tidy area; however, we will map out some core areas where AI is already adding value.





## Before You Buy AI

Before you implement an AI solution, you need to address the issues and limitations and manage expectations. Here are the actions to take.

**Address stakeholders' concerns** — Show stakeholders that you are aware of the issues and that you take the issues seriously. Set up online or in-person venues where stakeholders can express their concerns and get answers.

**Get accurate information by speaking to the vendor's data scientists** — Insist on speaking to the vendor's data scientists about the limitations of their product so you have an accurate understanding of the issues (data scientists are generally willing and eager to discuss these). It can be helpful to have your own data scientists (or one you hire for the occasion) speak to the vendor's data scientists.

**Compare the proposed AI solution with what you have now, rather than with a hypothetical perfect solution** — AI solutions have limitations, however what matters is whether or not it is better than the current solution. Do a realistic comparison between options rather than compare AI to some hypothetical perfect solution.

**Quantify the risk** — Where there are risks quantify (estimate) how likely they are to occur and how big the impact is likely to be. If you are not experienced in risk assessment, then ask a risk professional to take you through the thinking process.

**Test and learn through pilot projects** — With AI, you don't know what you don't know. It is difficult to get an accurate sense of the capabilities and limitations of an AI solution from watching a demo. Run pilots with the specific intent of learning more about how well it works in your environment, whether known issues are serious, and to see which unanticipated issues arise.

## Reducing bias in job postings

[AI can look through a job posting and reduce bias](#) by adjusting words that might deter a candidate based on gender. This is an automatic process that doesn't require extra effort from HR since the job posting is already there, the 'bias-check' works much like a spell-check.

One could imagine doing something similar without AI, such as searching for words like "aggressive" that you don't want in a job posting. However, that would involve a lot of manual work; an AI-based bias check provided by a vendor is a more practical solution.

---

**AI is a general-purpose technology and it can play some role in almost any imaginable task.**

---

## Screening resumes

Screening resumes is a tedious task that humans don't do particularly well. Today you can easily buy an AI tool that shortlists incoming resumes based on their similarity to resumes of applicants you've hired in the past. It's a lot like an email spam filter where it filters out resumes that don't look like a match while screening in the ones that do.

A more sophisticated approach to AI screening is to match resumes to some outcome variable such as performance or retention. In practice, it's easier to use retention as an outcome measure since there is usually better data available. This approach means you are screening in candidates who match an important outcome variable, not simply matching the kind of person your human recruiters have hired in the past. (Using previous hire data as the basis for selection can lead to incorporating unconscious bias into the criteria, as [Amazon discovered](#) when its AI tilted candidate selection toward white males.)

For this more sophisticated approach, Ken Lahti, chief science and innovation officer of SHL, says,

*“You’ll need a sample of 1,000 matched cases, you can do it with less but the quality degrades and you end up with an unstable algorithm. It’s a good approach for graduate roles in big accounting firms, as well as jobs in retail and hospitality.”*

When you are screening resumes, whether with humans or an AI application, you need to worry about bias and that’s something vendors watch for.

Somen Mondal, CEO of Ideal, says that in their experience the candidate’s name itself is often the biggest source of bias, and so they’ll eliminate names — and any other bias-inducing factors — from the training data used to teach the AI.



Somen Mondal  
CEO of Ideal

Note that in building these systems, even though they rely on machine learning, there is still a lot of guidance required by subject matter experts. You can’t just unleash a data scientist with an untrained AI tool on resume data and hope to get good results. The main limitation of this resume screening is that you need a lot of data, and that typically means jobs where you hire a hundred or more people a year. The second limitation is that, inevitably, some bad resumes get through and some good ones get screened out. This limitation is not that serious in high volume jobs because, it’s happening already with humans doing the screening, and, as long as the short list contains mainly good candidates, then that’s enough to move the hiring process forward.

There are many vendors ([Ideal](#), [Career Spark](#), [Plum](#), [ZipRecruiter](#)) that use AI to screen resumes. The tools emphasize resumes since they dominate recruitment today, however they can use almost any other source of relevant data such as information from social media or assessments. Similarly, it’s a small step from matching external candidates to job to using the tool to aid internal mobility.

## Matching jobs to resumes

Just as AI can screen resumes to match a job, it can screen jobs to match a resume (i.e. which job might this person be good for based on their resume). This works by using AI to extract skills from the resume and matching to jobs based on that. This is less specific but more widely applicable than a resume screening AI built for a single high-volume job.

You can try this out for free by going to [IBM's career site](#) and scrolling down to the "Ask Watson" button, this will launch the [Watson Candidate Assistant](#). [ZipRecruiter](#) also matches jobs to candidates this way.

## Screening candidates with a video interview

The most dramatic use of AI available today in HR is probably screening with a video interview. According to Nathan Mondragon, chief IO psychologist of HireVue, these interviews follow the best practices of behavioral interviewing with questions designed to elicit information on specific competencies. It's a 20 to 30 minute interview that asks about eight questions.

The AI looks at how candidates answer relative to how high performers answered along several dimensions:

- What was said
- How it was said
- Their facial expressions as they answered.



AI doesn't understand what was said with anything near the richness of human understanding, however it is enough to help with screening. If this seems a stretch, note how good Google Translate can be in translating documents even though it lacks the depth of understanding a human would.

In terms of "How it was said," imagine if high performers typically answer a particular question with rapid, short sentences whereas a low performer has a lot of pauses and rambling sentences (or vice versa). The AI can pick up on those differences, and if they are predictive of performance, it will use them in screening.

Finally, facial expressions are analyzed very much the way a human would. If the interview contains a question meant to invoke deep thought or to invoke creative thinking, you can imagine that certain facial expressions (a furrowed brow, looking up to the left as they ponder) are predictive of performance.

The promise of this approach is an automated screening tool that is both predictive and unbiased. For it to work well you need a good training set of data and a good team of experts building the algorithm. Note that your organization does not necessarily need to have many people in a given job to use this technology as long as the vendor has had access to data on a large number of people in that profession. For example, if the vendor has access to doctors in many hospitals, then they can build a model even when no one hospital itself has sufficient numbers.

The only way to know if this will work for some jobs in your organization is to speak to the vendors to see if it's worth trying, and then test the results to be sure it's sufficiently predictive and unbiased to be worth adopting. There is every reason to believe that just as AIs have learned to play a subtle game like Go better than humans, so too AIs may well learn to do the subtle art of interviewing better than humans.

## 4 Sins of HR Vendors

When shopping for a new HR system (or almost any business system now) it's almost impossible not to hear how it is AI-enabled, AI-powered or something similar. Beware! Here's what they'll tell you. And here's the reality.

1

**Claim:** "We designed in the latest AI technology."

**Reality:** Since the definition of AI is vague some vendors think they can get away with saying they use AI when they do not. Ask for specifics about what that means.

2

**Claim:** "This system is much more powerful than any other on the market because it is AI-enabled."

**Reality:** It may include some AI aspect, but it may be peripheral to the main features of the product. In other words, it's not important enough to justify your time and attention – or any additional cost – in the product selection process.

3

**Claim:** "The data is analyzed by an AI process to give you the most accurate and detailed results."

**Reality:** Vendors are often vague about what their AI actually does and how it really works. This makes it difficult to assess if it is adding value and what the limitations are.

4

**Claim:** "This is a huge improvement over your existing system."

**Reality:** It may have additional features and be a step up from existing technology, but will it make enough of a difference to justify the cost? For example, using semantic analysis to summarize survey comments may improve your understanding of survey results, however it's possible that simply reading a selection of comments (which you are probably already doing) is just as good.

## Assessments

An interview is one sort of assessment methodology that is being disrupted by AI; other assessment tools are being changed as well. Historically, an assessment would usually be a series of questions identical for each user. Now, adaptive testing chooses questions to ask based on the candidate's responses. For example, if you are trying to assess the level of programming knowledge of a software developer, you might ask questions of varying complexity depending on how the user is doing. You can also use adaptive testing to vary the test in many ways so it is harder for people to cheat.

SHL's Ken Lahti points out that the adaptive approach is not new; it's been around in some form for about 15 years. Specialists call this approach "computer adaptive testing." It is based on a psychometrics field known as [item-response theory](#).

---

Computer adaptive testing is based on a psychometrics field known as item-response theory.

---

Questionnaires are one source of data about a person, another set of data can be garnered by watching someone's behavior as they play a game. The assessment vendor [pymetrics](#) maintains games provide a more direct measure of the traits being assessed because you are observing actual behavior, not relying on self-reports. The

role of machine learning is to accurately find the link between how people behave in the game and the trait in question.

Another assessment technology that is similar to HireVue's video interviewing approach is to use video interviews to assess particular soft skills. [Knockri](#) (whose biggest customer is IBM) measures traits such as growth mindset, collaboration and empathy. To build this kind of assessment tool you take videos of a large number of people going through a structured interview and then get psychologists to score them on various soft skills. Once that input (the video) and output (soft skills scores) are collected, the vendor will use machine learning to learn to recognize the soft skills from the videos much like the psychologists did.

This is the same approach Google has used to train AI to recognize what is in an image. Knockri's CTO, Faisal Nisar Ahmed, stresses that while we may use everyday terms for soft skills such as "empathy," when you are building this kind of system you need to use valid psychometric constructs where there are agreed upon measurement scales.



Faisal Nisar Ahmed  
CTO of Knockri





In essence, these tools replace an assessment done by a psychologist with one done by AI. This matters because AI can be cheaper than a psychologist – Knockri can do an assessment for \$5(US).

---

**AI assessments can replace those performed by psychologists.**

---

## Assessments based on publicly available data

A hint of the future of assessment can be seen in tools that assess personality and soft skills based on information about a person that already exists on the web such as LinkedIn profiles, articles they have written and their Twitter feed. [IBM's Watson Personality Insights](#) can assess the big five personality traits (agreeableness, conscientiousness, extraversion, openness, and neuroticism) based on what someone has written. In this case, you may be able to assess candidates simply by looking for their online articles and hence have no need to call them in to do an assessment test. (You can [try this for free](#), however, it takes some time to go through the screens to set up the free account and get started). [DeepSense](#) has a similar capability and like IBM allows you to try it for free.

## Skills inference

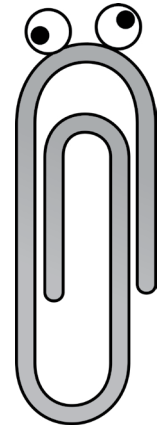
IBM has been using an AI tool that updates an employee's skills profile by scanning whatever data it has about them such as resumes, performance information, and certificates from courses they have completed. Employees need to audit this to ensure accuracy, so we might see this application of AI as a way to do some of the initial work for employees such that it encourages them to finish updating their profile manually.



## Intelligent assistants

AI has become surprisingly good at powering intelligent assistants that can provide advice on some narrowly defined topics.

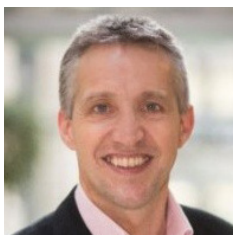
Microsoft has long tried to build assistants so that users of their software didn't need to rely on manuals. In the late 90s the assistant was an animated paper clip that many users found more annoying than helpful. Technology has finally caught up with Microsoft's ambitions and the current tools are genuinely interesting. For example, [Microsoft's MyAnalytics](#) can look at your calendar and, if it sees patterns that suggest you may not be making best use of your time, offer suggestions.



How useful are these assistants? They won't revolutionize productivity yet, but the technology has progressed beyond the stage when these tools were more trouble than they were worth. The intelligent assistants are particularly interesting because the range of things they can do and the quality with which they do them is likely to grow exponentially.

## Chatbots

Chatbots are also a "ready now" application for sharing information with employees or candidates or gathering information from them. Typically, they communicate in text, much like SMS messaging, however many can understand speech. How well they work depends on the situation, the simpler and more structured the information the more likely the chatbot is to be useful.



Andi Britt

VP, Talent & Engagement  
Leader Europe of IBM

Not all chatbots are true AI; most use if/then rules (i.e. decision trees). However, if they get the job done, that's all that matters to HR. If the goal is to provide information, then it's useful to think of a chatbot as an alternative to an FAQ page on your website. If users prefer the chatbot then that may be a good enough reason to use it.

Andi Britt, Vice President, Talent & Engagement Leader Europe at IBM, explains the difference between a chatbot using true AI and one based on decision trees is that AI can often understand the user's intent. A simple decision tree chatbot might be able to answer a question like, "What's the dress code?" if the programmer had thought to build that in. True AI can make sense of an unanticipated question like, "Do I need to wear high heels like Jennifer Lawrence?" and know it needs to find an answer related to dress code.

Nicolae Esanu, VP of Sales for Xor, explains how chatbots have evolved in his organization. The chatbots were initially built as a response to a need to handle the simple, repetitive communication with candidates that was bogging down Xor's internal



Nicolae Esanu  
VP of Sales for Xor

recruiters. The chatbot used a decision tree architecture able to handle a limited number of responses. Now they are increasingly using true AI (natural language processing) so that the chatbot can make sense of a wider range of queries from candidates.

The next step for Xor is to apply the same sort of intelligence to assessing the answers of candidates. This is done in a typical machine learning process where humans score a candidate's answer to a question about culture and the AI learns how to replicate those judgements.

Another application of chatbots is contacting candidates to ask them to fill in gaps the screening engine noticed in their resume. For example, if you need to know if candidates can work weekends, a chatbot can contact the candidate to get that information. Modal of Ideal says that chatbots can already go beyond simply filling in gaps in the resume with "yes/no" answers. Given adequate data, an AI powered chatbot can make a distinction between answers along the lines of "Definitely!" and those along the lines of "Yeah sure."

## Compensation advice

The most important use of AI in compensation that is "ready now" is providing advice to managers on what salary increase to give employees. Systems without AI can look at a few simple factors (e.g. compa-ratio, performance rating) to suggest an increase. Systems with AI can look at many more factors (e.g. market rate for the job, how hard the job is to fill, how much that skillset is needed in the company, the individual's likelihood of leaving etc.) to provide a more accurate recommendation. Managers can override the recommendation, however, with few exceptions, the manager will find the AI system has accurately assessed many different factors and come up with a recommendation better and much faster than they could have done on their own. IBM uses this kind of tool internally (Cogni-Pay) and [Beqom](#) has an AI-based compensation tool.

Of course, the AI needs access to data to provide that advice. For example, if you don't have information on how much a skillset is needed in your company, then AI can't take that into account in recommending salary increases.

---

Systems with AI can look at many more factors to provide a more accurate recommendation.

---

## Semantic analysis of engagement survey comments

One of the best “ready now” AI tools relevant to engagement is semantic analysis for summarizing written comments. AI is now smart enough to read through comments on an engagement survey (or in social media and even email and messaging tools) to provide insights on common themes or the overall mood.

This is a well-developed technology and can be a big leap beyond only looking at a handful of comments or not looking at them at all. [Willis Towers Watson's VERA](#) uses this technology and it is likely many organizations have benefited from this without recognizing it's a form of AI.



[IBM's Social Pulse](#) uses AI to look at comments on IBM's social communication sites and on Twitter to understand the mood and what topics people are talking about. The power of this tool is that it can be looking through hundreds of thousands of posts, 24/7, and bring the most urgent topics to management's attention.

You can also use these tools to analyze the emotion in emails from clients or even in your own emails if you want to check whether the emotion you are conveying is what you mean. One tool that does this is [Watson Tone Analyzer](#) and it's a tool you can test out for free once you've gone through the slightly difficult registration process.

## Learning recommendations and AI coaches

Recommendation engines such as found on Netflix and Amazon are proven technologies. Whatever their limitations, they are better than having to browse through thousands of options. Learning platforms such as [Degreed](#) and [FeatherCap](#) now incorporate recommendation engines to suggest relevant courses.

Coaching chatbots are another tool of interest to learning professionals. A coaching chatbot presents information in a more personalized and conversational way than traditional eLearning. Many coaching chatbots, such as the cognitive behavioral therapy coach [Woebot](#), do not yet use AI, just well-designed decision trees.

IBM [Watson Career Coach Myca](#) (an acronym for “my career advisor”) responds to questions such as, “How long should I stay in my role?” by looking at data at how long IBMers typically stay in similar roles or it can answer, “Where can I go next in my career?” by seeing what other IBMers with similar skill profiles have done. The great advantage of these AI-based tools is that they learn over time, so you don't need to reprogram them. The limitation is that you have to have data about employee skills and employee movement.

## Job taxonomies

Creating a taxonomy of all the types of jobs in the world, like the [US Standard Classification](#), the [European Skills/Competencies, Qualifications and Occupation \(ESCO\)](#) or the [International Standard Classification of Occupations 2008 \(ISCO-08\)](#) is hugely difficult to do and painful to maintain. AI can automatically create a taxonomy by scanning large numbers of job postings and using semantic analysis to find clusters of similar work. This is not quite off the shelf, but the capability exists ([e.g. Revelio Labs](#)).



## Analytics

For years people have used standard statistical tools to build a model to predict who is likely to leave the company (“flight risk”). Now, they are more likely to use machine learning to make that prediction. [Visier](#) and [Workday](#) have flight risk algorithms built into their product that tune themselves to a given organization based on its data, and which continue to learn over time.

IBM is using AI to monitor how long it takes to fill various job requisitions and then, based on what it’s learned, predict how long they will take to fill. This gives the talent acquisition team advance warning of difficult to fill jobs.

The same AI tools that allow you to look for themes in comments on an engagement survey can be used to look for common issues in queries made to your HR service center; this can help illuminate where problem areas are. It can also be used to assist help center employees by finding how their peers have answered similar questions in the past. This can work even if these are voice calls since NLP does an adequate job of voice to text translation.

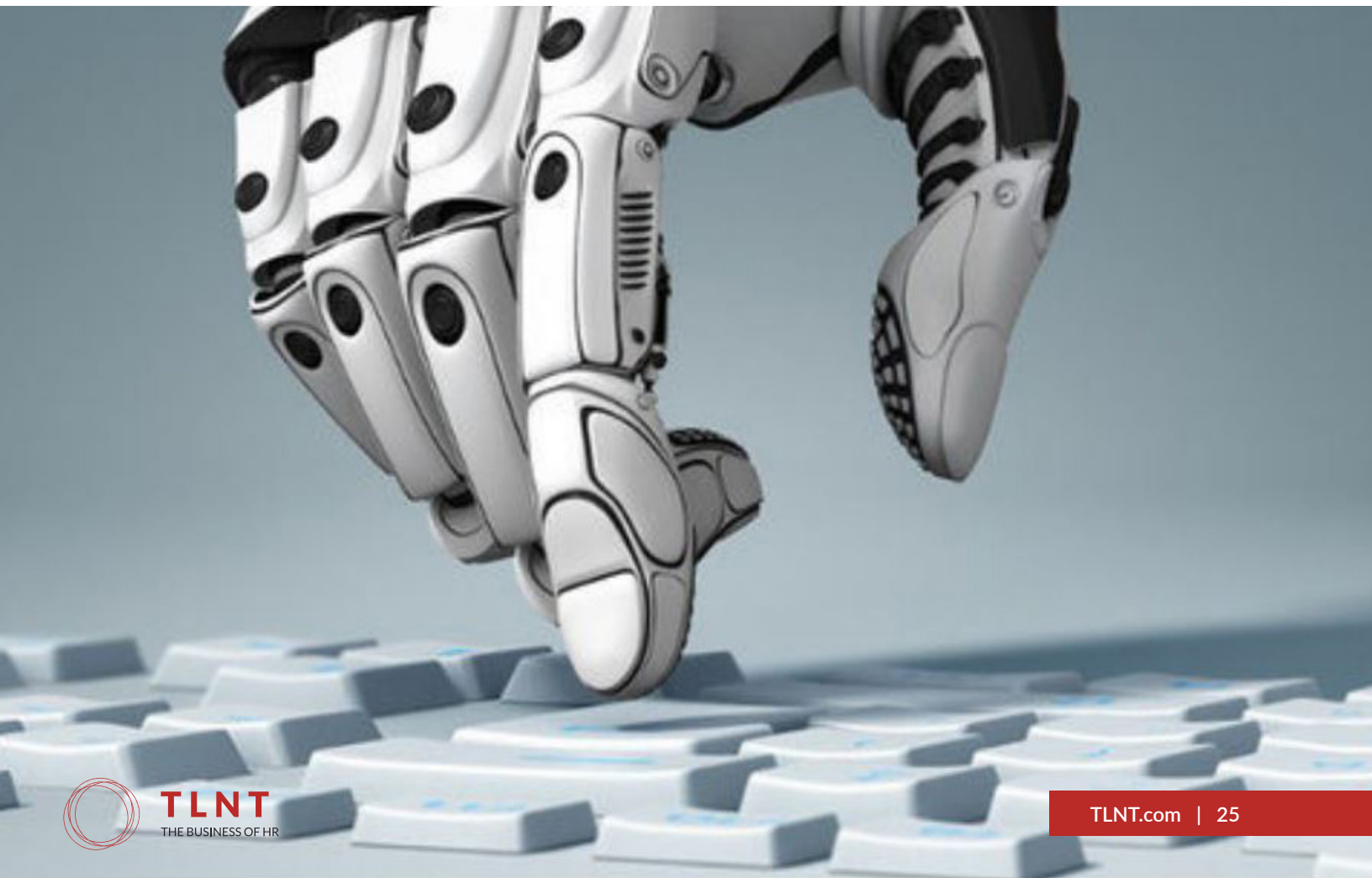
## Summing up

The list of AI applications for HR quickly becomes exhausting. The good news is that in many cases the AI is built into the application and you may not even know it is there. Tools that seem like science fiction – a video interview conducted and scored by AI – will feel ordinary once they have been in a place for a few months.

Perhaps the most important question to ask in deciding on the right AI tool is:

*“What is the business trying to accomplish?”*

Clarity about the end we are trying to achieve, will help prevent us being distracted by the complexity or the novelty of the means we are using to get there.



# INTO THE FUTURE

Over the next two to five years AI will go from being something exceptional, widely promoted by vendors, to one that pervades HR. Just as SaaS was a technology differentiator not that long and now is expected, AI in most business applications will reach that point in the near term.

You can get a sense for what AI will be able to do in the near future by looking at a video of what [Google Duplex](#), a chatbot, can do now: Converse like a human when making an appointment by telephone. This is very close to being a “ready now” application and certainly in the next two to five years you can expect this kind of capability in a wide range of chatbot applications. More broadly, Google Duplex illustrates how quickly we go from AI applications that are cool but don’t work very well, to ones that are mind-blowing. Let’s take a look at some of the things that are on the near horizon:

- **Personalization & clusters** – One broad change driven by AI will be an opportunity to provide more targeted HR interventions whether that be at the level of the individual or at the level of clusters of employees (e.g. introverted ones). Instead of clustering employees by department or location or demographics we will be able to find much more useful groups (e.g. groups with an innovative culture that we can learn from).
- **Shift from predictive to prescriptive analytics** – We will start hearing about prescriptive analytics rather than predictive analytics. AI tools are becoming smart enough that they can offer advice. Rather than simply predicting flight risk they will offer advice on what to do in a specific case. Rather than wait for a manager to advise employees to talk to someone about a project or problem we may find intelligent assistants taking that on, based on knowledge of the organization and what the employee is working on at the time.



# AUTOMATION

- **New opportunities from textual transcription** – It is now easy to automatically transcribe conversations such as interviews, customer calls, and meetings. This provides a rich source of data for AI. Expect to see new applications that rely on capturing and analyzing conversational data.

## Automation will take over many HR tasks

More immediate is the implementation of robotic process automation (RPA) to replace much of the repetitive, manual work now done by HR generalists and assistants. [Ernst & Young estimates](#) that 65% of rules based HR processes can be automated. Automating payroll processing can result in an 80% cost reduction.

RPA and artificial intelligence are not the same. One is not dependent on the other, but when linked, the combination is powerful. As the EY report *So Will Embracing Robots Mean Replacing Humans?* notes:

*As RPA undertakes the systematic and behind-the-scenes jobs, AI will complement the software to add thought, judgment and intelligence to HR, as well as other departments.*

## Looking further ahead

Futurist [Ray Kurzweil](#) talks about the “singularity,” the point at which AI has advanced so much that we cannot imagine the world beyond that point. He sees that point as occurring around 2045, but you don’t have to buy into the most dramatic visions of the future to agree that it’s difficult to speak with much confidence about AI in HR and the entire organization five to 10 years out, let alone 25.

On the other hand, if we think of a major organizational change, five years doesn't feel long at all. Rather than focusing on the AI tools that might be available for HR we should be thinking about how AI may affect our organization and how to deal with that change.

This is a much discussed issue, addressed in multiple papers from a variety of organizations and think tanks ([Deloitte](#), [PwC](#), [World Bank](#)) and in forums and conferences, including one organized by the [White House in December 2018](#).

With RPA taking over the repetitive manual work and AI assuming much of the remaining transactional tasks, [PwC says](#) 63% of organizations are rethinking the role of their human resources department. Thus HR will need to transform into a more strategic function, redesigning the very nature of work and workforce management and providing high level workforce analytics and services.

A good starting point is for HR is to have discussions with business leaders on how the industry is likely to change and then work back from there to the talent and culture implications. For example, if your business leaders expect AI to change the skill sets in

## What to Do Now

It won't be long before all HR technology includes some aspect of artificial intelligence. To make use of the full power of these tools, there are 6 important steps to take now to prepare for your AI future:

**1 Own the data** – AI lives on data, make sure you don't lose control of data to vendors. You need easy access to all your data and the ability to get it back if you switch vendors or the vendor goes out of business.

**2 Link data to the individual employee** – If data (such as from an engagement survey) is not linked to individual employees, it loses much of its value. Be aware of emerging privacy laws and those like the European Union's GDPR. For many purposes, it may be enough to aggregate the data.

**3 Improve data management and governance** – Good data management is difficult and is becoming a critical skill for HR. It takes a long time to get data management in good shape and if you do not start now you could fall years behind the competition.

**4 Learn to measure performance outcomes** – Many uses of AI depend upon having good measures of performance. Measuring performance is complex, however since that is the output needed to make good decisions, you can gain a competitive advantage if you have better measures.

**5 Talk to vendors about what is around the corner** – Any technology you invest in today may look out-of-date in a couple of years. Regularly talk to a wide range of vendors. Insist on clarity, transparency and validation of their claims.

**6 Build an innovation capability in the organization** – The organization should have an innovation strategy and innovation capability. HR should be part of that as well as having its own strategy and capability. There is too much disruption in the world to leave innovation to chance.

operations in five years, then HR should know about that now. Even if it's too soon to hire for new skills, it's not too soon to figure out how to build the capability to do that hiring when the time comes.

Helping the business thrive through the disruption AI will engender will be an important role for HR and one that will vary significantly by industry. However, there are a few universal issues HR leaders should be considering:

- A strategic understanding of AI. Do your leaders have a good grasp of how AI will impact their industry? If not, then HR needs to take a lead in education.
- An ability to implement AI. There will be many technology implementations in all parts of the company that have an element of AI. Is there enough expertise across the organization to make good use of AI and lead successful implementations?
- Prepare for job loss. Oxford University researchers Carl Frey and Michael Osborne believe that [47% of U.S. workers have a high probability of seeing their jobs automated](#) over the next 20 years. Does HR know which jobs are likely to be made redundant? Is there a plan for how to deal with any place there may be mass redundancies?
- Ability to deal with change. As Ravin Jesuthasan and John Boudreau point out, AI usually eliminates tasks rather than whole jobs. Does HR have plans to ensure employees can adapt to the changes AI will force upon them?
- Organization design. As some jobs disappear and other are re-configured the organization structure will need to change. Does the organization have the cultural ability and technical skill to reconfigure as needed?

Deloitte says it will be up to senior leaders and HR to:

*Ask fundamental questions about which work tasks and activities can be automated, what technologies to use, and what combinations of people and smart machines can effectively do the work. A renewed, imaginative focus on workforce development, learning, and career models will be important.*



## Analyze Your Existing Skills

- ▶ How many people in the function have hands-on experience with AI?
- ▶ How good is HR at implementing significant changes in a short time period?
- ▶ How robust are your strategic processes for scanning the environment, staying at the forefront of technology and intelligent risk taking?

# CONTRIBUTORS

This report was produced by TLNT.com, a news and information site for HR professionals published by ERE Media, Inc. David Creelman was the lead researcher and writer. Supplemental research and content was provided by John Zappe, who also edited this report. Jen Shick designed the report and produced the graphics.



## AUTHOR BIO – David Creelman

David Creelman is CEO of Creelman Research. Based mainly in Toronto and partly in Kuala Lumpur, he's known for his research on people analytics and the future of work.

His consulting work has focused on helping HR business partners become more analytics-savvy and work more effectively with the analytics team. This usually fits within the context of building HR capability.

His books include *The CMO of People: Manage employees like customers with an immersive predictable experience that drives productivity and performance* with Peter Navin; and *Lead the Work: Navigating a world beyond employment* with John Boudreau and Ravin Jesuthasan.



## EDITOR – John Zappe

John Zappe is the editor of TLNT.com and a contributing editor of ERE.net.

John was a newspaper reporter and editor until his geek gene lead him to launch his first website in 1994. In 1998 he was named to head a new media division for Belo newspapers that included a 10,000 subscriber internet service provider.

Two years later, he joined the Los Angeles Newspaper Group as Vice President of Digital Media. In that position he grew the 7 person team into a profitable, multi-million dollar operation with a dozen sites and winning several awards.

Before joining ERE Media in 2006, John was a senior consultant and analyst with Advanced Interactive Media, focusing on the employment sector. He's trained and managed several digital media sales teams.

As a newspaper reporter, John won multiple regional and state reporting awards, including the prestigious National Headliner award. As an editor, his team won consecutive top reporting awards from the Los Angeles Press Club and the California Publishers Association.

John is a graduate of Marist College and Syracuse University School of Law.

In his spare time, John trains dogs and competes in agility, obedience and nosework. His dogs compete at the master level and have participated in national championship events.



## GRAPHIC DESIGNER – Jennifer Shick

Jen Shick is a freelance graphic designer and has been working with ERE since 2014.

Jen started her own graphic design business over 12 years after working with a marketing and advertising agency for 3 years after college. Jen graduated from Moravian College in Bethlehem, Pennsylvania with a B.A. in Marketing Management focused on graphic design.

Jen lives in PA with her husband, two kids and dog. In her free time, Jen likes to read, hike, DIY projects and vacationing with her family.