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## How AI is Transforming the Workplace

Artificial intelligence is changing the way managers do their job—from who gets hired to how they're evaluated to who gets promoted



Ted Greenwald  
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The growing use of AI in the workplace raises many questions. Among them: Is it too intrusive? ILLUSTRATION: VIKTOR KOEN FOR THE WALL STREET JOURNAL

Move over, managers, there's a new boss in the office: artificial intelligence.

The same technology that enables a navigation app to find the most efficient route to your destination or lets an online store recommend products based on past purchases is on the verge of

transforming the office—promising to remake how we look for job candidates, get the most out of workers and keep our best workers on the job.

These applications aim to analyze a vast amount of data and search for patterns—broadening managers’ options and helping them systematize processes that are often driven simply by instinct. And just like shopping sites, the AIs are designed to learn from experience to get an ever-better idea of what managers want.

Consider just a few of the AI-driven options already available:

A company can provide a job description, and AI will collect and crunch data from a variety of sources to find people with the right talents, with experience to match—candidates who might never have thought of applying to the company, and whom the company might never have thought of seeking out.

Another AI service lets companies analyze workers’ email to tell if they’re feeling unhappy about their job, so bosses can give them more attention before their performance takes a nose dive or they start doing things that harm the company.

Meanwhile, if companies are worried about turnover, they can use AI to find employees who may be likely to jump ship based on variables such as the length of time they’ve been in the job, their physical distance from teammates or how many managers they’ve had.

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### Will They Stay or Will They Go?

Some of the many types of information that go into an analysis by Workday software of how likely an employee is to leave a company

- **TIME** since last promotion
- **BONUSES** as compared to last year
- **TIME** since last raise
- **EMPLOYEE** performance and potential
- **MANAGER** performance and potential
- **ATTRITION** under employee’s manager
- **TIME** off taken
- **STOCK** grants over time
- **TEAM** size
- **LOCATION** of the employee
- **LOCATION** of the employee’s team
- **LOCATION** of the employee’s manager

Source: Workday Inc.

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Still, the same data-analysis technology that promises to make managers more effective also sweeps them into uncharted territory. With its relentless focus on facts, AI seems to overcome supervisors’ prejudices, but it can have its own biases, such as favoring job candidates who have characteristics similar to those the software has seen before. Automated decision-making may also tempt managers to abdicate their own judgment or justify bad decisions that would have benefited from a human touch.

Another caveat: These systems are fairly new, and we really don't know yet whether they make decisions that are as good as or better than human managers. And it would be difficult to devise a foolproof way to test that.

And the biggest caveat: The AI systems' thirst for data can lead employers to push the boundaries of workers' privacy. It is incumbent upon managers to use them wisely.

That said, all the vendors mentioned in this article professed concern for privacy and include in their tools features designed to keep the data they collect under customer control, if only to enable customers to comply with privacy policies and laws. Here's a closer look at some of the ways AI is remaking hiring and managing workers, and some of the benefits and downsides it may bring.

## Spotting the best candidates

Companies using AI for personnel management may start implementing it before workers are even hired—to help them find the best candidates for jobs.

Such software often works in one of two ways: spotting the most promising resumes among what may be an unmanageable deluge, or widening the net so employers can find a more diverse pool of candidates than they would select on their own.

SAP's Resume Matcher software, which is being tested by some customers of the company's SuccessFactors division, read Wikipedia entries to understand job descriptions, related skills and so on.

Then it correlated what it learned with tens of thousands of anonymized resumes—provided for the purpose by a separate group of customers—along with notes on whether a given applicant was shortlisted, interviewed, hired and the like.

It uses that analysis to rank fresh candidates for a new job opening. Hiring managers can reorder the ranking according to experience, skills and education, and then dive into resumes that look promising.



“Recruiters spend 60% of their time reading CVs,” says Juergen Mueller, SAP’s chief innovation officer. “Why should a person read 300 resumes if a machine can propose the top 10?”

Entelo Inc. takes the opposite approach by searching out candidates rather than waiting for applicants to approach the company. It combs the web for public information on individuals—some 300 million so far—and offers a web app where recruiters can search for candidates who might be a match.

Factors Entelo considers include job titles, employers and posts in professional forums, as well as factors an employer may be looking for, such as gender, race and military service. Recruiters can tell the software if the candidates it suggests are off track and why (selecting from a menu or writing in plain English), and it will tune its search more precisely.

Becky McCullough, directory of recruiting at digital marketing firm [HubSpot](#) Inc., has been using Entelo for roughly one year and says it has dramatically boosted her department’s productivity.

“It has set new benchmarks for response rate,” that is, the percentage of candidates who reply to a recruiter’s solicitation, “and we can a/b test various outreach tactics,” she says. “It has put more rigor [into our process] and given us access to more data on candidates who are either very early in our recruiting process or are not yet there but who we’re trying to engage.”

## Tracking what workers do at their desks

Once managers have hired ideal candidates, artificial intelligence can help keep them productive by tracking how they handle various aspects of their jobs—starting with how they use their computers all day.

Veriato makes software that logs virtually everything done on a computer—web browsing, email, chat, keystrokes, document and app use—and takes periodic screenshots, storing it all for 30 days on a customer’s server to ensure privacy. The system also sends so-called metadata, such as dates and times when messages were sent, to Veriato’s own server for analysis. There, an artificial-intelligence system determines a baseline for the company’s activities and searches for anomalies that may indicate poor productivity (such as hours spent on Amazon), malicious activity (repeated failed password entries) or an intention to leave the company (copying a database of contacts).

Customers can set activities and thresholds that will trigger an alert. If the software sees anything fishy, it notifies management.

Dancel Multimedia of New Orleans uses Veriato to keep a team of around 16 artists, animators, salespeople and administrative employees on track as they produce supporting materials for attorneys to present in court. “It has allowed us to be more streamlined and focused on the task at hand,” says Dancel CEO Celeste O’Keefe. “We can see what they’re doing and guide them in the right direction.”

Employees sign an agreement indicating they know that their actions are recorded, but “it’s kind of like surveillance cameras in a store,” Ms. O’Keefe says. “Everyone forgets, so they try to steal anyway.”

She checks up on new hires roughly three times weekly and longer-term employees only when she wants to address a productivity issue. She doesn’t use alerts—and thus the system’s AI capabilities—but says she would consider it if she were managing a larger team.

She says it takes five minutes to skim Veriato’s graphs and screen grabs to spot or diagnose a problem, which usually stems from lack of familiarity with software tools used by the company. But sometimes the issue is personal. “When I feel like somebody might not be doing whatever they were working on, I can glance on there and see, ‘Well, no wonder! You’re on [Facebook](#) for three hours a day or you’re on sites buying shoes and clothes,’ ” she says.

She resolves problems by explaining what the system showed her and offering to help. Her use of Veriato has resulted in at least one firing, but it has also given her insight that enabled her to retain good employees who simply needed guidance.

## Do you know where your employees are?

Companies can also track employees' whereabouts in the office. Bluvision makes radio badges that track movement of people or objects in a building, and display it in an app and send an alert if a badge wearer violates a policy set by the customer—say, when a person without proper credentials enters a sensitive area. The system can also be used to track time employees spend, say, at their desks, in the cafeteria or in a restroom.

Bluvision's AI compensates for the margin of error in determining location of radio transmitters, allowing the system to locate badges with one-meter accuracy, according to COO John Sailer. Without it, people near one another would be indistinguishable, and the positions of doors, desks, walls and the like—useful information for security and optimizing use of space—would be blurred.

Mr. Sailer says the system is also useful in situations where contractors are paid hourly or piecemeal, such as on a construction site, where subcontractors must complete work in order and on schedule to avoid cost overruns.

Although Bluvision tracks individuals, it can also be set to present only aggregate trends. That allows customers to take advantage of location tracking without breaking privacy laws or agreements protecting personally identifying information about employees.

## A question of feelings

AI is also beginning to help managers peer into personal aspects of job performance that used to be left up to managers' instincts and observations—for instance, attitudes toward the job. Veriato analyzes email and other messages, looking at words and phrases employees use. Then it scores those expressions for positive or negative sentiment. The system can set a sentiment baseline over time, and then calculate a daily score for each employee.

It can send an alert if a worker's use of certain language exceeds a threshold, or if it detects any change in tone or a shift in relation to a group of employees. The customer can evaluate the context in which the expression occurred—including screenshots captured by the system—to decide how to proceed. "If the tone of a typically happy person suddenly goes negative, that may be an alert that they're at risk of flight, insider threat or even just a productivity problem that needs remediation," says Veriato Chief Security Officer David Green.

## Keeping top performers on board

Some AI aims to predict when employees may be winding down their career at the company—and advises how to keep them on board.

Products from Entelo, [International Business Machines Corp.](#) and [Workday](#), as well as [Microsoft Corp.](#)'s internal management system, look for patterns identified by researchers and their own software to predict when workers are likely to jump ship.

For instance, Workday's retention-risk analysis feature, which made its debut in April, bases its analysis on data from selected customers representing 100,000 individuals over 25 years, says Leighanne Levensaler, a senior vice president of corporate strategy at Workday. It tunes itself to a given customer, calculating a risk score for individual employees based on roughly 60 factors including job title, compensation, time off and time between promotions.

The software also suggests potential next steps in an employee's career path based on what other people in similar situations have done, so managers can move proactively to retain valuable workers. Ms. Levensaler says the retention-risk score is best thought of as one element of a broader picture, "a pattern we see that's instructive for you in your conversation, but you're still managing."

## The limits of AI

For all their promise, these systems raise a number of issues. Some are evident today, in the early stages of adoption, while others may take time to become clear.

Privacy is an obvious concern when tracking employees, particularly personal behavior. Systems that sort job candidates also raise questions. Entelo's may emphasize people with a large online

footprint; SAP's might prefer those who best match characteristics of people who were hired in the past.

Entelo Chief Executive Jon Bischke acknowledges the possibility that the data set in his company's recruiting system is biased, but says it doesn't necessarily affect his customers. "Our area is hiring for highly skilled jobs," he says. "The vast majority of candidates [in that area] have a presence on the web."

Mr. Mueller of SAP says that, in practice, Resume Matcher reduces bias by highlighting a more diverse selection of candidates than managers otherwise would have considered. "Many recruiters were surprised when they saw the candidates, but when they looked deeper, they could see why the system selected them," he says. For instance, one manager testing the system was taken aback by the high ranking of candidates from China that he otherwise would have overlooked; he was unfamiliar with the top Chinese schools where they were educated.

Beyond that, the use of such tech in workplaces is new and not widely proven—and in many cases it may not be easy to determine that a machine's insight was sharper than a human would have perceived. That's a concern when inaccuracy in an AI report—painting someone as a poor performer, for example—might set back an employee's career.

[Forrester Research](#) Inc. analysts David Johnson and J.P. Gownder voiced such concerns in a recent report. The authors argue that employers' ability to gather data about employees has outstripped managers' capacity to interpret it properly, opening the door to a variety of counterproductive practices.

Managers tend to pay attention to what they can measure, Mr. Johnson says—hours spent in workplace apps, say, rather than quality of output. Focusing on individual performance may lead managers to overlook hindrances to productivity that are systemic.

"I don't want to cast negative light on these companies" selling data-driven management tools, Mr. Johnson says in an interview. "They don't have control over how people use their products. I'm just pointing out the risks."



Some management professionals share those worries. Kenny Mendes, who runs recruiting at a software startup that hasn't yet launched publicly, previously directed human resources at the online work-collaboration service [Box](#) Inc. (He is an adviser to Entelo.)

Mr. Mendes spent two years experimenting with ways to predict and maximize employee success using a statistical programming language and “lots of spreadsheets.” The experience led him to believe the problem is too complex for the current generation of software.

The limitations of current approaches, he says, boil down to the difficulty of drawing valid conclusions from incomplete data.

For instance, measurements of employee performance at any given company are based on the set of people hired and lack information about candidates who were passed over—or weren't even interviewed—who may have, say, produced more in less time. Aggregating data from many customers, as some larger vendors including SAP and Workday do, can reduce bias, but the problem remains that different companies may not track the same variables in the same way, and subtle but important ones are likely to be missing.

Moreover, management systems can't account for conditions outside the office that may energize or depress individual employees at work—especially personal conditions that can shift unpredictably. On top of that, human psychology is a wild card; if workers know their overseer is tracking hours on the job rather than output quality, they may spend an extra hour a day at the office simply chatting by the water cooler.

“Even the smartest people will make bad decisions with bad data, and I think we have a lot of bad data in this process,” Mr. Mendes says.

He favors technology that helps managers “without disqualifying people.” However, he believes the most effective personnel-management tools are references, work-product tests, and strong personal relationships between supervisors and their charges.