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Big Data, Trying to Build Better Workers

By STEVE LOHR

BOSSES, as it turns out, really do matter — perhaps far more than even they realize.

In telephone call centers, for example, where hourly workers handle a steady stream of calls under demanding conditions, the communication skills and personal warmth of an employee's supervisor are often crucial in determining the employee's tenure and performance. In fact, recent research shows that the quality of the supervisor may be more important than the experience and individual attributes of the workers themselves.

New research calls into question other beliefs. Employers often avoid hiring candidates with a history of job-hopping or those who have been unemployed for a while. The past is prologue, companies assume. There's one problem, though: the data show that it isn't so. An applicant's work history is not a good predictor of future results.

These are some of the startling findings of an emerging field called work-force science. It adds a large dose of data analysis, a k a Big Data, to the field of human resource management, which has traditionally relied heavily on gut feel and established practice to guide hiring, promotion and career planning.

Work-force science, in short, is what happens when Big Data meets H.R.

The new discipline has its champions. "This is absolutely the way forward," says Peter Cappelli, director of the Center for Human Resources at the Wharton School of the University of Pennsylvania. "Most companies have been flying completely blind."

Today, every e-mail, instant message, phone call, line of written code and mouse-click leaves a digital signal. These patterns can now be inexpensively collected and mined for insights into how people work and communicate, potentially opening doors to more efficiency and innovation within companies.

Digital technology also makes it possible to conduct and aggregate personality-based assessments, often using online quizzes or games, in far greater detail and numbers than ever before.

In the past, studies of worker behavior were typically based on observing a few hundred people at most. Today, studies can include thousands or hundreds of thousands of workers, an exponential leap ahead.

"The heart of science is measurement," says Erik Brynjolfsson, director of the Center for Digital Business at the Sloan School of Management at M.I.T. "We're seeing a revolution in measurement, and it will revolutionize organizational economics and personnel economics."

The data-gathering technology, to be sure, raises questions about the limits of worker surveillance. "The larger problem here is that all these workplace metrics are being collected when you as a worker are essentially behind a one-way mirror," says Marc Rotenberg, executive director of the Electronic Privacy Information Center, an advocacy group. "You don't know what data is being collected and how it is used."

Companies view work-force data mainly as a valuable asset. Last December, for example, I.B.M. completed its $1.3 billion acquisition of Kenexa, a recruiting, hiring and training company. Kenexa's corps of more than 100 industrial organizational psychologists and researchers was one attraction, but so was its data: Kenexa surveys and assesses 40 million job applicants, workers and managers a year.

Big companies like I.B.M., Oracle and SAP are pursuing the business opportunity. So is eHarmony, the online matchmaking service. It announced in January that it would retool its algorithm for romance so it could examine employee-employer relationships, and enter the talent search business later this year.

THE penchant for digital measurement and monitoring seems most suited to hourly employment, where jobs often involve routine tasks. But will this technology also be useful in identifying and nurturing successful workers in less-regimented jobs? Many companies think so, and can point to some encouraging evidence.

Tim Geisert, chief marketing officer for I.B.M.'s Kenexa unit, observed that an outgoing personality has traditionally been assumed to be the defining trait of successful sales people. But its research, based on millions of worker surveys and tests, as well as manager assessments, has found that the most important characteristic for sales success is a kind of emotional courage, a persistence to keep going even after initially being told no.

The team of behavioral and data scientists at Knack, a Silicon Valley start-up firm, uses computer games and constant measurement to test emotional intelligence, cognitive skills, working memory and propensity for risk-taking. Early pilot testers include the NYU Langone Medical Center, Bain & Company and a unit of Shell, says Guy Halfteck, Knack's C.E.O.

Google, not surprisingly, is committed to applying data-driven decision-making to human resource management. For years, candidates were screened according to SAT scores and college grade-point averages, metrics favored by its founders. But numbers and grades alone did not prove to spell success at Google and are no longer used as important hiring criteria, says Prasad Setty, vice president for people analytics.

Since 2007, the company has conducted extensive surveys of its work force. Google has found that the most innovative workers — also the "happiest," by its definition — are those who have a strong sense of mission about their work and who also feel that they have much personal autonomy. "Our people decisions are no less important than our product decisions," Mr. Setty says. "And we're trying to apply the same rigor to the people side as to the engineering side."

Evolv, a San Francisco start-up, uses data science to advise companies on hiring and managing hourly workers. Evolv is sharing its data from clients — data that are stripped of personally identifying information and demographics like race and sex — with researchers at Wharton, Yale and Stanford. (This column's first two examples came from Evolv's data and analysis.)

Michael Housman, an economist and managing director of analytics at Evolv, says he thinks work-force science will increasingly be applied across the spectrum of jobs and professions, building profits, productivity, innovation and worker satisfaction.

Evolv, he says, has focused initially on hourly workers and call centers, which capture masses of data on every call and online exchange. Jobs at these centers are often difficult and have very high rates of attrition, routinely as high as 100 percent a year. "We wanted to start where there was a huge opportunity" to make improvements, he says.

Transcom, a global operator of customer-service call centers, conducted a pilot project in the second half of 2012, using Evolv's data analysis technology. To look for a trait like honesty, candidates might be asked how comfortable they are working on a personal computer and whether they know simple keyboard shortcuts for a cut-and-paste task. If they answer yes, the applicants will later be asked to perform that task.

Those who score high on honesty typically stay in their jobs 20 to 30 percent longer than those who don't, Evolv says.

Neil Rae, an executive vice president of Transcom, was impressed with the project's results and plans to use Evolv in the call centers he runs, which employ 12,500 workers.

In the call-center world, Mr. Rae says, 5 percent attrition a month — 60 percent a year — is stellar performance. Dropout rates are calculated at 30-day intervals, and it takes four to six weeks to train a worker. The cost of attrition — for hiring and training a replacement — is about $1,500 a worker, he says.

In the project with Evolv, Mr. Rae says, Transcom was able to hire fewer people — about 800 instead of a more typical 1,000 hires — to get 500 workers who were still on the job at least three months later. The big payoff, he says, should come in cost savings and better customer service with less worker churn in call centers.

“This makes hiring more a science and less subjective,” Mr. Rae says.