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From: www.cio.com

HR Departments Invaded By Data Scientists

– Stephanie Overby, CIO

August 27, 2013

[When General Motors](#) was looking for someone to lead its global talent and organizational capability group, the \$152 billion carmaker clearly wasn't looking for a paper-pushing administrator. Michael Arena, who took the position 18 months ago, is an engineer by training. He was a visiting scientist at MIT Media Lab. He's a Six Sigma black belt. He's got a Ph.D.

This is not your father's human resources executive.

But it is a sign of where the corporate HR function is headed. Arena is dedicated to the hot field of talent analytics--crunching data about employees to get "the right people with the right talent in the right place at the right time at the right cost," he says.

"[Talent management](#) is a soft space. Historically, we haven't been able to measure definitely the things that we intuitively believe to be true," says Arena. "But businesses are mandating it." The age of "trust me, this will work" is over, says Arena. "HR is being held accountable to deliver business results. And the language of the business is analytics."

[Sidebar: See "9 Critical Success Factors for Talent Analytics" at the end of the article.]

The growing importance of sophisticated analytics to HR--not simply reporting what already exists in an organization but predicting what could or should be--is a result of "the recognition that the efficient use of labor and deployment of resources is critically important to the business results of the company," says Mark Endry, CIO of Arcadis U.S. He recently spent six months as interim senior vice president of HR at the \$3.3 billion company.

In recent years, enterprises have developed more mature techniques for applying analytics to customer information. "They've been able to see--with relatively little data--how much they can do and how powerful the results can be," says Ben Waber, author of *People Analytics: How Social Sensing Technology Will Transform Business and What It Tells Us about the Future of Work*. "When you think about what's going on within companies, you have potentially billions of records generated every day about each person. They're starting to see how valuable and important that data is."

IT must be at the center of the unfolding data-driven transformation. Not everyone has an [HR data scientist](#) like GM. Arena emphasizes the importance of his partnership with Bill Houghton, GM's CIO for global corporate functions. "A big piece is integration--ensuring the right systems are connected so we know where to draw the data from," says Arena. "IT has to play a role in that."

Indeed, GM's CIO is counting on a new enterprise data warehouse--and hiring more IT professionals with a business intelligence background--to support HR's efforts. "Right now the analysis is being done by small group of smart people," says CIO Houghton. "The next step is how do we make the analytics

more available to the everyday manager or the organizational leadership. We want to get this out of the hands of the rocket scientists and into the hands of managers."

CIOs are the key to helping the organization figure out what data matters, says Terry Sullivan, director of applied research and consulting at office furniture maker Steelcase. "Everyone is thinking about [big data](#) and collecting all kinds of data to try to figure out how to create smarter people. CIOs can drive this effort."

IT leaders are uniquely qualified to help their corporate counterparts navigate the minefield of issues associated with these nascent technologies and processes—including data quality, systems integration, security, privacy and change management. "The partnership with IT is critical," says David Crumley, vice president of global HR information systems for Coca-Cola Enterprises.

There's a broad array of uses for talent analytics: screening new hires, figuring out who should get promoted, efficiently staffing new projects, uncovering the characteristics of high-performing individuals or teams, and even predicting who's likely to head out the door.

"The way I think about it is using data to understand how people get work done," says Waber, CEO of Sociometric Solutions, a management-services firm that was built on his work at MIT Media Lab and that helps companies in one niche of the talent analytics field: collecting and analyzing sensor data to improve workforce performance.

Companies have collected employee data for years—from satisfaction surveys to ethnography. But, says Waber, this "next generation of stuff is moving away from those qualitative assessment modes into much harder behavioral modes, using digital data from email or sensors or ERP systems. That gives us radically more powerful information."

Historically, HR used data to report headcount or turnover information. "We're so far beyond that now," says Crumley of Coca-Cola Enterprises. "HR wants to expand its capabilities to help the business grow. To do so, we need to be able to be more precise and surgical about our interventions. That's where workforce analytics is huge—helping you determine where to place your bets."

Laying the Foundation

Employees generate petabytes of data about themselves every day, says Waber. But that data sits in disparate systems in different formats and is often messy. "To make it work, you need access to all of this information in real time," Waber says. "IT is the backbone for this entire process."

Implementing a single version of an HR information system itself may not sound revolutionary, but it's a critical first step for companies interested in more advanced analytics.

Jo Stoner, senior vice president of worldwide HR for Informatica, knew predictive talent analytics could benefit the growing data-integration company. "A lot of companies don't make it past a billion [in revenue]. We were starting to hit those awkward teenage years," she explains. Managing the company's assets would be critical to maintaining momentum. But "we don't own buildings or raw materials," says Stoner. "Our greatest asset is our talent." First, though, the company had to bring all its HR data together, applying the master data management services Informatica delivers to clients to its own internal employee data in order to layer analytics atop it.

For most companies, just arriving at a single version of the HR truth can be beneficial. Paul Lones, senior vice president of IT at Fairchild Semiconductor, says that two years ago, managers at the chip maker lacked a single system that could provide an accurate tally of employees worldwide, let alone show the amount of employee turnover. Reports had to be compiled from multiple systems. Succession planning took place in Microsoft Word documents. Compensation decisions might be made in isolation.

Now that the company has implemented cloud-based Workday, managers can access data on all 9,000 employees in one place, including succession plans, turnover trends and salary information. "A manager in the Philippines considering a raise and promotion for an employee can see in seconds how that will compare with others in the group and with local compensation trends and make that decision," says Lones.

It may not be rocket science, but it's a start—one that's been a long time coming for many HR groups.

Chiquita Brands, for example, had multiple homegrown and manual HR systems.

"It was a cobbled-together thing," says Kevin Ledford, Chiquita's CIO. "People spent 90 percent of their time figuring out where the data was and 10 percent on analyzing it." In 2008, the company moved to a global HR system (Workday), which came in handy when Chiquita moved its headquarters from Cincinnati, Ohio, to Charlotte, N.C., and lost 75 percent of its corporate employees.

"It was very tumultuous. We threw all of our monkeys in the air, and they all came down in different buckets," says Ledford. "It would have been a nightmare [without the global HR system]." Now that the company is exploring predictive HR analytics, that success with master data management "is everything," says Ledford.

At Arcadis, Endry has connected his cloud-based workforce-management system to 11 other pieces of software, including ERP, learning management, payroll and an active directory. The combined data helps the company, which provides engineering services regarding infrastructure, water, environment and buildings, to staff client projects more efficiently and effectively.

"In the past we couldn't tell who was mobile," says Endry. "Now when we have a giant project in Ohio, we can see on a dashboard that we've got these three people in Boston willing to move there."

Marc Franciosa, CIO of Praxair, has tied the company's HR and employee performance systems to non-HR systems like SharePoint as a foundation for the company's talent analytics initiative—no small task for the \$11 billion industrial and medical gases company with 26,000 employees in 50 countries.

"The underlying data and processes have to be consistent to be able to do any real analytics with confidence," says Franciosa. "For companies that are fairly mature that haven't had a global environment before, it's going through that initial normalization and standardization process to make sure that this certification, for example, means the same thing around the world," says Franciosa. (He implemented SumTotal's HR management system and ElixHR platform to link disparate data.) "The cleanup has been a challenge."

Now, when Praxair wants to make a bid or sign a new customer, managers can analyze HR implications first. Do they have people who speak Portuguese, have the necessary certification, and are willing to relocate to Rio de Janeiro? "We can do some modeling of the skill sets to determine if it's doable or if we will have to recruit externally," Franciosa says.

At GM, Arena has been implementing a three-phase analytics plan. First, integrate systems in a way that ensures highly accurate data is available. Next, push much of that data into standardized reporting tools and dashboards that business managers can use on their own. Then start building models. One of the first projects Arena implemented was a means-based comparison analysis of the top talent pool. The model examines every employee data field in the PeopleSoft database to look for important insights, Arena says. "Five or six experiences may jump out. Having international experience may statistically matter. Then we dig deeper. Are there certain types of international experiences that matter more than others? Does that need to happen earlier versus later?"

Divining Interventions

The real power is in applying predictive analytics to a corporate population. "Everyone's talking about it," says Chiquita's Ledford, "looking at all this data you have and trying to figure out the future."

"The typical data warehouse approach is looking back, but what we wanted to do was start looking forward," says Praxair's Franciosa. "What are the leading indicators we should be looking for? What are those metrics or data sets we don't have but, if we did, would really help us? What external data sources could we use to drive better decision-making?"

For example, Praxair is growing by double digits in China. "Rather than hiring a ton of people and trying to recreate the wheel [there], what I've been driving is how do we replicate rapidly those things that have made us successful in our mature geographies," says Franciosa. "There's a huge opportunity to use predictive analytics based on where we're best-in-class."

The predictive analytics market for HR is nascent and wide-open. "We partner with them all, from IBM to SuccessFactors to PeopleSoft," says GM's Arena. "They're all trying to play in the space, but I don't

know that any of them have figured it out."

Arena's team has built a model that predicts what changes in attrition rates will mean for GM's workforce. Previously, if someone proposed hiring a bunch of young engineers, no one could be certain if that was the best decision. "Now we can say, let's see what that looks like five years from now," Arena says. "What are the dividends if we hire 200 entry-level engineers? Might we be better off hiring 50 advanced engineers? We can take that information to the head of engineering and say, 'Here's what it will cost you.'"

Arena thinks that analyzing the interactions of networks of employees holds the most promise. The process starts with a survey. "We ask questions of a given network: Who do you go to when you want to shop a new idea? Where do you turn when you need resources to get things done? Then we run the analytics," Arena explains. "We can tell you who the brokers are, who's central in that network, who are the bridges across silos. We can even predict who's a flight risk based on where they sit in the network." And by identifying which employee networks are most productive, Arena says there's a chance to improve performance across the company.

At Coca-Cola Enterprises, Crumley is integrating business data with HR data for predictive purposes. "That's where you can really get sexy with it," he says. While working with IT to clean and standardize all the data, Crumley is partnering with each corporate function to find out what business metric might be the key measure of success for their employees. By combining those business metrics with people data, he hopes to be able to "reverse engineer what a successful employee is, so we can get the best candidates in the future."

Employee engagement is a leading indicator of talent retention at Coca-Cola Enterprises. And one of the biggest boosters of employee engagement numbers is access to on-the-job learning, so Crumley's team is trying to figure out how to make training opportunities more universal. For example, why are folks in this shift at this plant not taking classes as much as other employees in that line of business? With answers to questions like that, HR can intervene to address the core reason, whether that's an accessibility problem or a manager who needs more coaching. Crumley says the effort will gain even more steam when HR is able to show, through data analytics, a correlation between taking a specific training course and an improvement in sales or productivity.

At call-center provider NOVO 1, CTO Mitchell Swindell has implemented a predictive hiring tool from Evolv. Applicants complete a Web-based application that screens for attitude, propensity for customer service, and voice capabilities. The software also shows the candidate what it's like to work in a call center in hopes of screening out those who would be a poor fit in the high-turnover industry. The tool then gives the candidate a red, yellow or green rating, at which point candidates rated green or yellow are invited for in-person interviews. The hiring decision is still in the hands of a human, but the system has predicted with 80 percent accuracy the company's top performers, based on 90-day follow-up data on the hired employees. Since introducing the algorithm-enhanced hiring system, tenure is up by 25 percent, agent productivity has increased 30 percent, and the overall staffing budget has decreased 11 percent. Swindell has integrated Evolv with the company's payroll, workforce-management and proprietary quality systems to help develop a more nuanced profile of the best employees.

At Chiquita, Ledford is exploring predictive analytics to help the company find, train and retain its "bananaeros"—experts in growing bananas. "Those guys are really hard to find, as bananas have taken a backseat to coffee and tourism," says Ledford. Analytics could enable managers to predict which lower-level employees "could become our next wave of banana folks," says Ledford, and determine the right training and grooming to make that happen.

Employee Tracking

There's also a gold mine of information in how people move through an organization, and a handful of companies are looking at physically tracking employees—often via RFID-enabled badges—to find out how people work and what impact that can have on business outcomes.

"The barrier at this point is not the technology," says Waber, whose Sociometric Solutions is an early provider of sensor-based analysis. "I can tell you how much more money a company makes when two employees eat lunch together. We can do extremely sophisticated things. The challenge is that organizations are not used to looking at themselves this way."

When GM's Arena was senior vice president of leadership development at Bank of America in 2010, the financial services company used sensors to track 90 call-center workers over the course of several weeks and found that those in the most cohesive networks were the most productive. By switching from solo to group break times, encouraging more socialization, agents improved efficiency by 10 percent. "As silly as it sounds, it worked," says Arena. "The analytics told us it was probably the right thing to do." Sometimes it's as simple as moving desks closer together, says Waber. Steelcase's Sullivan has discovered that the size of lunch tables can have an impact on productivity. You can't force people to interact more, says Waber, but based on the data, you can "engineer serendipity."

Although Arena conducted a number of experiments using sensor data at BofA, he's not quite ready to start tracking workers at GM. "I'm a huge advocate of sensor work," Arena says. "But it's laden with trust and privacy issues and a lot of organizations just aren't ready for that. It can be a bit of a slippery slope."

Praxair is conducting a pilot using sensors on its remote workers. The system will measure how long it takes a worker to, say, install a tank for a customer, by monitoring their movements via a sensor on their protective equipment. The sensor also monitors workers for exposure to harmful gases. If gas is detected, an alarm goes off and the monitoring center will attempt to communicate with the worker. Franciosa envisions integrating the sensor data into other corporate systems to uncover correlations between events and particular locations, types of employees, or certifications.

The Importance of Transparency

Franciosa expects employees to put up some resistance to being physically tracked, much like the pushback the company encountered when it was first placing computers onboard its trucks. "It was viewed as Big Brother wanting to know how fast I drive or how hard I brake," says Franciosa. "The way to alleviate that is transparency. People won't like being physically monitored if they think we're trying to find out how long their break was. So we have to be completely transparent that we are using this for safety and long-term productivity. They'll recognize the value in that."

HR collects all kinds of sensitive employee information, but employees see physical tracking as particularly intrusive. "It is *the* boundary to cross," says Steelcase's Sullivan. All of Steelcase's sensor-related experiments are opt-in. Company analysts see only aggregate data, not individual histories. And Sullivan's team communicates the process and the intentions not just to those who have signed up, but also to everyone on the campus.

"In the U.S., employees don't really legally have protections around this data. A company can track you wherever you go and listen to all your conversations," says Waber. "But that defeats the purpose of this approach, which is trying to help people work better, be happier and stay at their jobs."

Communication is critical with any collection and analysis of people data--not just sensor data. "I don't think we're doing anything that people haven't been trying to do for years," says Informatica's Stoner. "But we have to say what we will do with that data."

Praxair's Franciosa has a close partnership with his legal teams around the world to navigate the various data privacy and protection issues in each country. "But even once we understand that we can have this data, we have to be very transparent and say, here's why we want your picture or your talent profile," Franciosa says. "That goes a long way toward gaining both credibility and traction."

The Role of Data in the People Business

"What's really happening right now is a shift in HR from an art to a science," says Crumley of Coca-Cola Enterprises, who's currently exploring how social network data and gamification might become part of his HR analytics platform. "A lot of HR teams are trying to figure out how to make that shift quickly so it's no longer HR sitting around waiting to be pulled in, but HR coming to the table with nuggets of wisdom."

Data analytics could enable HR to elevate itself from a tactical support function to a business partner on strategy, which ought to sound pretty familiar to CIOs.

But there are limits to HR's data-driven transformation. "[Analytics] are all about probability, and there's just so far you can go with probability," says Crumley. "If you want to figure out how many employees

you need to launch a new product, it can get you in the right ballpark. When it comes to predicting turnover, it's not an exact science. People are people."

"It's never black-and-white when you're talking about people," says Stoner of Informatica. While some folks get stars in their eyes when talking about big data, Stoner often sees a bigger haystack to sift through. But analytics, she says, help point companies in the right direction. "In HR, we live in a world where data brings more questions. You always have to look beneath it," she says. "It's not an exact science. But at least it gets us looking at the right part of the haystack so we can get to the answer faster."

That's why GM's Arena says his talent analytics will never be fully automated. "Sometimes we get projections wrong for all kinds of reasons. It can take several iterations. But HR still loves it, because it equips them to make intelligent decisions for their business partners."

9 Critical Success Factors for Talent Analytics

IT and HR leaders who have deployed workforce analytics systems offer these tips for success

Lay the foundation. Aim for a single source of HR information, if possible.

Account for imperfections. "We've got our foundational issues, for sure, but if you wait until it's completely perfect, you won't get anywhere," says Michael Arena, GM's director of global talent and organizational capability. IT can build reconciliation processes and automated audits to help HR with data issues.

Start small. Marc Franciosa, CIO of Praxair, began with an analytics pilot to map the company's high-potential employees. "If we had tried to do one big-bang workforce analytics project, it would never have gone anywhere," he says. "You have to get some traction in order to get credibility."

Tap internal experts. Both Franciosa and Arena have taken advantage of statisticians and others from their corporate R&D groups to develop their talent analytics programs.

Share the load with HR. Take advantage of HR and IT's complementary skills. IT can focus on vendor management, security and deployment, while HR might manage requirements gathering, process standardization and communication.

Bring in business know-how. David Crumley, VP of global HR information systems for Coca-Cola Enterprises, works with business leaders from functions such as supply chain, sales and finance to determine what data will drive talent analytics.

Hire external change-management help. Typically, HR leads change management in an organization. But avoid DIY change management in analytics efforts, warns Mark Endry, CIO of Arcadis U.S., who recently spent six months as interim SVP of HR. Hire external help to guide HR through its big changes.

Take action. "Everyone wants to have more data, but we have to ensure that folks know how to use it," says Crumley, who had to do more hand-holding than he initially anticipated. "It's not that anyone is pushing back, but you have to embed the use of the data into the [corporate] DNA."

Democratize the systems. For people analytics to truly deliver, they need to be self-service tools that business managers and leaders can use. "Early on, we thought the customer [for these tools] was HR," says Crumley. "But it's the business leaders that control these decisions daily."

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