NEWS

Companies must teach employees how to swim in new oceans of data

By Katherine Noyes

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Take a quick tour through the C-suite of any major corporation today, and there's a good chance you'll see some titles that weren't there a few years ago: chief data officer, chief data scientist, chief analytics officer, to name just a few.

Data is the element they all share in common, and it's affecting more than just the executive ranks.

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In the business world's headlong rush to collect as much data about as many things as possible as quickly as it can, a question has been left for later: How do you turn those massive volumes into practical value? Turns out, "later" is now, and there's a crushing shortage of specialized data scientists. Few companies, meanwhile, even have a plan for bolstering their data talent.

At virtually every level of the organization, staffers are being asked to cope with and find meaning in more data than ever before. That's causing a significant shift in the skills required to get the job—any job—done.

"Today's workforce needs to be more data-savvy," said Jeffrey Camm, a professor of business analytics at the University of Cincinnati. "Not everyone needs to be a data scientist, but nearly everyone will need to learn to utilize the data to make more data-driven decisions."

That's easier said than done. Enterprise software vendors have begun incorporating new, easy-to-use analytics tools into their products, but for the most part, it's up to companies and universities to help the workforce adjust to these new expectations.

"As I see it, there are two real workforce training needs: the data analysts and the consumers of the analyses," Camm said.

For the former group, there are now more than 100 master's degree programs in analytics and data science, up dramatically from just a few years ago, he pointed out. "Higher education has listened to industry and has developed some very good programs in analytics," he said.

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The tougher challenge may well be finding the best way to educate the rest of the staff, from shop-floor supervisors and call-center operators all the way up to those in the executive suite. Regardless of their role, Camm said, the fundamental question is: What data analysis skills does that person need to do his or her job better?

The University of Cincinnati offers a variety of professional development courses in data and analytics that are open to the public, including titles like “Advanced Data Mining,” “Analytics in Excel” and “Prescriptive Analytics: Building and Solving Optimization Problems.”

Such programs are still rare, however. On the whole, universities traditionally don’t do a very good job of teaching business students how to use math and statistics, said Tom Davenport, a professor of IT and management at Babson College and co-author of Keeping Up with the Quants.

“Business students generally don’t like quant courses,” he said. Given an extra week, meanwhile, most quantitative analysis faculty “would rather teach more about factor analysis than how to tell a good story with analytics. It’s a big problem.”

DataCamp is a startup that’s focusing squarely on that problem. The 18-month-old company is building an online data-science school whose mission is to prepare students and professionals for the information economy with affordable, interactive data-analysis training.

Current courses focus on topics including data visualization, dynamic reporting, R programming and large data sets. They don’t follow a traditional academic format, however. Rather, short video lessons and online programming challenges are used to teach the material, all of which is delivered through the browser. Some classes are free, but students can also pay a subscription fee of $25 per month or $250 per year for access to all the school’s offerings. DataCamp doesn’t offer degrees, but students earn badges and statements of completion for each course they finish.

In its first year, DataCamp trained more than 100,000 people, said Jonathan Cornelissen, its cofounder and CEO. “That shows that there’s a real need for data-science education,” Cornelissen said. “The mission of DataCamp is centered around the belief that we need new approaches for training in data science.”

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A full 70 percent of DataCamp’s students so far have been professionals working in the business world, he noted. “They get confronted with data in their jobs and need to be able to visualize and understand it.”

Future plans for the online school include courses on topics such as data cleaning, manipulation and modeling as well.

Educational programs are one approach to helping employees think about data in new ways, but they’re not the only one. Some organizations are moving in a different—and far more unconventional—direction.

At the Albert Einstein College of Medicine in New York, for instance, the Center for Epigenomics is working with artist Daniel Kohn for help cultivating new insights into genetic data.

“I’m interested in how we create meaning,” said Kohn, who previously spent a decade as the founding artist in residence at the Broad Institute for Genomic Research. “People tend to think that what we see is what is, and all we need to do is assimilate it.”

Born in India and raised in France, Kohn credits his multicultural and artistic background for his unconventional approach. “There was always the sense that you can bring multiple frames of reference to understand any situation,” he said. “We don’t just paint what is—we paint from a point of view with a tradition.”

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Similarly, when viewing scientific data, it’s important to explicitly recognize the scientific traditions underlying your approach, along with the fact that they might not be the only possibilities, Kohn said.

It’s a common belief that tackling big data is simply a matter of building bigger machines and better algorithms. “I say you need to develop new metaphors to understand the reality you’re

looking at," Kohn said. "It's the stories that give the meaning. We need to find out what are the new, appropriate stories for the world we're looking at."

Kohn's approach is helping, said John Greally, director of Einstein's Center for Epigenomics.

"His naivete is his strength," Greally said. "He comes in and says, 'what are you showing here? Why did you choose blue and red in that scatter plot? What if you could click on a dot and see a whole other dimension?' He has a very good sense of what's in front of him in a visual way, and it challenges us greatly."

The hope is that, by encouraging scientists to think outside the traditional scientific "box," Kohn will enable the sparks of insight that so often seem to come from out of the blue.

"A lot of discoveries are due to a certain amount of chance, when you have a flash of intuition that's not just rational," Kohn said.

Ultimately, what's needed are new visualization tools that allow users to make intuitive judgments about data without requiring an extensive understanding of the systems at hand, Greally said.

The partnership has been in place for only about 18 months, so it's still too early to assess the full benefits, Greally said. Still, at the very least, "I would say that the visual representations we're doing now are probably more sophisticated" than the standard heat maps and scatter plots that are traditionally used.

In the past, analytics may have indirectly informed business decisions, but today, it has taken on a much more central role, said Kirk Borne, a data scientist and professor at George Mason University.

That, in turn, requires new, multidisciplinary approaches. In a company, that means giving a wide variety of employees data analysis skills.

An orchestra that consists of musicians who play only one type of instrument might give a few great performances, but, Borne said, "a truly great data-science team needs a variety of members in order to compose and perform great 'music' together."

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Katherine Noyes has been an ardent geek ever since she first conquered Pyramid of Doom on an ancient TRS-80. Today she covers enterprise software in all its forms, with an emphasis on cloud computing, big data, analytics and artificial intelligence.

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