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How do you retain your data scientists?

For starters, shield them from office politics

By Daniel Byler and Jeff Loucks

Data scientists are in demand, and they know it.

Retaining talent after a merger or acquisition is a well-known management challenge. The difficulty executives have experienced in meeting it is a key reason many M&A deals fall short of expectations.[1] This should be a special concern as companies scramble to place artificial intelligence (AI) and cognitive computing among their core competencies.[2] Over $34 billion was spent in the past five years on AI-related startups,[3] in many cases by companies paying for talent more than for actual products or technology.

With data scientists in short supply and costing as much as $500,000 a person,[4] it is critical to retain them post-deal, but it can be a vexing challenge. Data scientists

are in demand, and they know it. They spend an average of one to two hours a week looking for new jobs and welcome offers from potential employers.[5] As Deloitte noted in a recent report,[6] these new employees are often millennials who are passionate about creating technology that could change the world. Their new company will likely differ significantly from their previous firm: bigger, more process-driven, and less focused on the "mission" they signed up for. And they may resent that the start-up entrepreneurs who originally hired them—who may well have been classmates or friends—might play greatly diminished roles in the new organization.

But help may be at hand—by putting to work some of the cognitive computing capabilities that companies are acquiring. Using sophisticated machine learning algorithms on a global survey of 16,700 data scientists conducted by Kaggle,[7] Deloitte gained unique insights into the mind-sets of these frontline AI workers, and how changes in their work environment could affect their job satisfaction. The ultimate goal of this research is to help companies understand what these important—and often dearly acquired—employees need to be productive and happy. After all, productive and happy employees add value and stay put. (For additional details on how to interpret a machine learning model, please see our open source package model describer.[8])

Among the highlights: Data scientists can be easily aggrieved by office politics. While they care about salary, they are even more concerned about their compensation levels being on a steady upward trajectory. They appreciate, and even demand, access to their field's latest tools and techniques.

Kaggle's survey of data scientists inquired about demographic staples—age, job title, salary—along with other questions specific to data science. Using a 10-point scale of job satisfaction, with a higher score associated with a happier employee (the average was 6.9 in the subset we studied), we scoured the data to see which factors had the most substantial predicted impact on job satisfaction.

The single largest effect we observed involved office politics, which can be a serious problem for data scientists. Many data scientists feel poorly equipped to handle it. And companies that are building data science teams may struggle to provide the support and direction they need—especially if they're new to the game.[9] Data scientists in a strife-ridden work environment—compared with one free of infighting, and with all other factors being equal—had job satisfaction that was 1.3 points lower, making it the biggest move we saw in the entire data set.
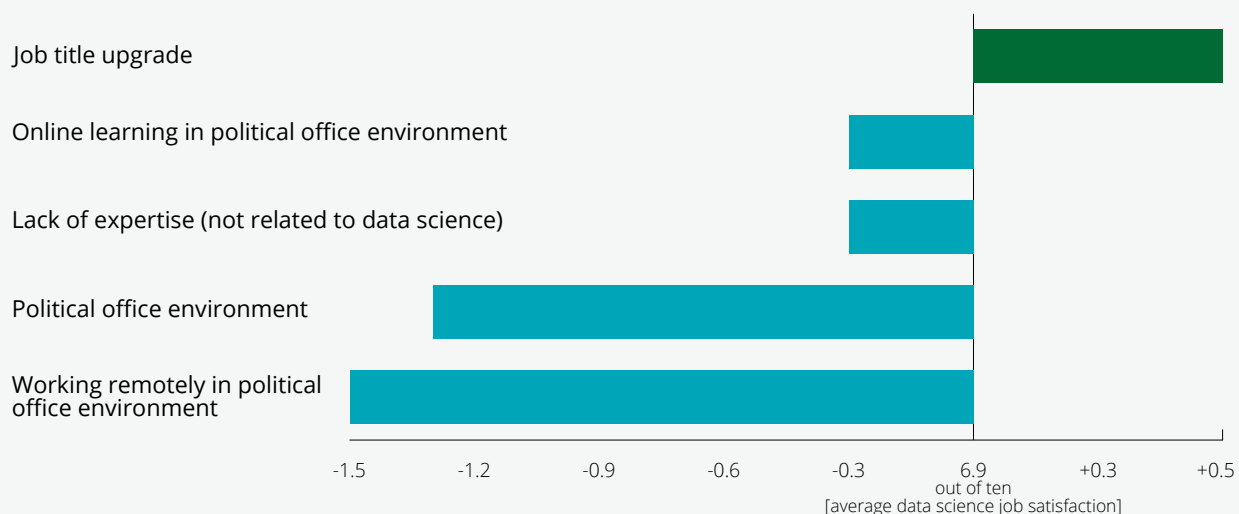
Managers at acquiring companies need to pay special heed here. Many AI workers are at "millennial-friendly" start-ups, and fully 60 percent of them say they do not have to deal with office politics in their current jobs. Of course, integrating an acquisition can create just the sort of uncertainty and "office politics" that send data scientists heading for the exits. "Where are we going? Who's going to be our boss? How come *he's* a VP now?" Importantly, having political issues

at work was correlated with having more "unused work products"—for example, algorithms that are never adopted and don't generate insights. This further underpins the negative impact of political infighting and perceived lack of support from business leaders.

Additionally, it would be a mistake to think that allowing your data scientists to work remotely will be an effective bandage for a difficult office environment. We discovered that the more people work off-site, the more affected they are by political issues: Remote workers in politicized work environments experienced a job satisfaction decline of 1.5 points, compared with a decline of 1.2 points for persons always in the office. Clearly, a strong corporate culture gives you the flexibility to allow more remote work. However, remote work can exacerbate underlying issues if your corporate culture is fractious.

On-the-job training also fails to mitigate the corrosive effect of office politics on data scientists. In offices where tensions run high, increasing the proportion of learning time spent online from 33 percent to 54 percent resulted in a projected 0.3-point *decrease* in job satisfaction.

What drives job satisfaction of Data Scientists?

Factor	Impact
Job title upgrade	+0.5
Online learning in political office environment	-0.3
Lack of expertise (not related to data science)	-0.3
Political office environment	-1.3
Working remotely in political office environment	-1.5

out of ten
[average data science job satisfaction]

Source: Deloitte analysis of data from *The State of Data Science and Machine Learning: 2017,* Kaggle, 2017
Deloitte Center for Technology, Media & Telecommunications

Moral: If your programmers are excited about a hot new analysis package, get it in their hands.

Our analysis uncovered another surprising finding: Survey respondents showed they expected to learn "on the job" by being exposed to new tools and techniques. Companies that have an internal learning platform show an anticipated 0.3-point improvement in job satisfaction compared with those that don't. Moral: If your programmers are excited about a hot new analysis package, get it in their hands.

Taken together, these two findings show the importance of understanding how data scientists feel about their work environment. If your most talented data scientists are doing online training, you need to be sure it is because they are passionate about data science. Otherwise, they could be learning online out of frustration with their work situation, rather than a desire to deliver more value for their current employer.

In general, data scientists like being exposed to new technologies, but they aren't keen about being asked to work in subject-matter domains with which they are completely unfamiliar. Lacking domain expertise "most of the time" is associated with an expected 0.3-point decrease in job satisfaction when compared with domain expertise never being an issue.

In short, data scientists like using new technologies that help them build on their experience. They don't like being thrown in the "deep end" of subject matter outside their domain and then expected to swim. This often happens when data scientists and business leaders don't communicate effectively about project goals and expectations. When they fail to speak each other's language, business leaders can get frustrated and tell data scientists to "go figure it out." Data scientists quickly find themselves on unfamiliar terrain, without a clear question to answer or metrics of success.[10] Strong project management and "translators" between the business and data science experts[11] can ensure that expectations on both sides are clear and reasonable—and that data scientists feel they know how to do what's required.

Not surprisingly, when we looked at compensation, we discovered that pay levels are important. We were intrigued to learn, however, that compensation *momentum* is even more important than the size of an employee's current paycheck. Data scientists are more likely to accept relatively modest salaries if they know they can look forward to regular raises that keep their pay at industry standards.

Sometimes, simply recognizing high achievement is all it takes. Changing a job title to make it more representative of an individual's actual duties resulted in a predicted 0.5-point increase in job satisfaction. This happens to be another area where the harmful effects of poor office morale are evident. An "upgrade" in job title is twice as effective in improving satisfaction at sites with political issues than it is where workers don't have to suffer such tensions in the first place.

To summarize, we reached into the data science toolbox to develop a deeper understanding of what data scientists—the experts for whom companies are paying dearly—want. When you've acquired them through an acquisition, make sure they are insulated from the stress and politics of integrating them. Give them new tools with which to experiment, but provide clear direction, and don't ask them to move out of their comfort zones. That starts with ensuring that data scientists and business decision-makers communicate effectively. In addition, cultivate a positive sense of career momentum by rewarding strong performers frequently—not only through raises, but also via recognition.

Few doubt that AI is transforming businesses. Fortunately for companies looking to transform themselves by purchasing AI competencies, the very tools they are bringing on board can also be of service in helping ensure the smooth integration of acquired talent. Of course, old-fashioned common sense should play a role as well: Human and artificial intelligence complement each other superbly.

Endnotes

1. Estimates vary, but surveys of executives in TMT and across industries show that many M&A deals fail to deliver the value leaders expect. In a recent Deloitte study, "The state of the deal: M&A trends 2018," one in 10 respondents said that more than half their deals did not deliver the return on investment they had anticipated. This was down significantly from Deloitte's 2016 survey, in which 40 percent said more than half their deals did not deliver. In another recent study, 92 percent of TMT executives said a recent M&A deal had fallen short of expectations. See: John Harrison, Axel Majert, Ken Welter, and Clarence Mitchell, "Merger integration in a converging world," EYGM Limited, 2017.

2. The terms "artificial intelligence" and "cognitive computing" are used interchangeably in this article.

3. Artificial Intelligence Deal Tracker: Q1'13 to Q1'18, CB Insights, April 11, 2018, https://www.cbinsights.com/research-artificial-intelligence-startup-deals.

4. Cade Metz, "Tech giants are paying huge salaries for scarce A.I. talent," New York Times, October 22, 2017, https://www.nytimes.com/2017/10/22/technology/artificial-intelligence-experts-salaries.html.

5. Stack Overflow Developer Survey, 2017, https://insights.stackoverflow.com/survey/2017. See also, Richard Waters, "How machine learning creates new professions—and problems," Financial Times, November 29, 2017.

6. Joost Krikhaar, Jeff Loucks, and Marco Sguazzin, "Mergers and acquisitions in tech, media and telecom," Deloitte Center for Technology, Media & Telecommunications, 2018, https://www2.deloitte.com/content/dam/Deloitte/us/Documents/technology-media-telecommunications/us-mergers-acquisitions-tech-media-telecom.pdf.

7. "The state of data science and machine learning: 2017," Kaggle, 2017, https://www.kaggle.com/surveys/2017.

8. Daniel Byler, etc. al, Deloitte, 2018, https://github.com/datasciencesquad/model-describer

9. Data scientists have written many first-hand accounts of the travails of coping with office politics. For an example, see this blog post: "The most difficult thing in data science: Politics," https://www.rdisorder.eu/2017/09/13/most-difficult-thing-data-science-politics/.

10. Ibid. In fact, the Kaggle survey found that the "lack of a clear question to answer" was a top workplace challenge, cited by 30 percent of data scientists. "Results not used by business decision-makers" and "explaining data science to others" were close behind at 24 percent and 22 percent, respectively.

11. Mic Locker, Jeff Loucks, and Paul Sallomi, "Technology, media, and telecom get smarter," Deloitte Insights, March 2, 2018, https://www2.deloitte.com/insights/us/en/focus/cognitive-technologies/AI-applications-in-technology-media-and-telecom.html.