

What Data Scientists Do All Day at Work; Ram Narasimhan of GE talks about the importance of curiosity and what makes his day

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ABSTRACT

Wall Street Journal reporter Deborah Gage spoke with one--Ram Narasimhan, who works at General Electric Co.'s GE Global Research in San Ramon, Calif.--to shed some light on the profession. A former managing director at United Airlines in Chicago, Dr. Narasimhan moved to the Bay Area in 2012 and was among the first data scientists hired by GE.

FULL TEXT

Demand for data scientists is growing, driven by companies and government agencies that are flooded with data and struggling to make sense of it.

But what exactly do data scientists do? Wall Street Journal reporter Deborah Gage spoke with one--Ram Narasimhan, who works at General Electric Co.'s GE Global Research in San Ramon, Calif.--to shed some light on the profession.

A former managing director at United Airlines in Chicago, Dr. Narasimhan moved to the Bay Area in 2012 and was among the first data scientists hired by GE. He has a doctorate in operations research and industrial engineering from the State University of New York at Buffalo, but he says the most important quality in his job and for any data scientist is curiosity. Here are edited excerpts of the conversation.

Starting at the airport

WSJ: What led you to become a data scientist?

DR. NARASIMHAN: I was an engineer by training and was drawn to math and applied math in general--the math you use for puzzles. I did my master's and Ph.D. in applied math and operations research. [These skills are] really useful for airlines, and I got hired at United and spent about 12 years there. My colleagues and I would decide where should we fly, how often, how big or small a plane, how many people should we carry, how do we compete, what are other airlines doing, how much can we charge and network optimization--how to build a schedule month after month.

Then I got really intrigued by operations, what goes on in airports. We would plan all these fancy things, and in operations something would go wrong, like snow in Chicago. We would be scrambling and the airline would be scrambling, and we said hey, maybe we can build smaller models on what are our options [in these cases].

WSJ: What kinds of problems do you work on at GE?

DR. NARASIMHAN: What data scientists do at Google or Yahoo or Facebook is a little different from what we at GE do. It's more around maintenance of assets—something GE built or something running in a GE plant. Can you keep this asset running for a little longer, what are the maintenance costs, can you do a few repairs and save so much cost.

Amazon gives recommendations for all of us, they want us to watch this video, for instance, and once in a while they get it wrong, but the cost of getting it wrong is small. But in industrial data science, it's something we worry about a little more. If there's pressure, if there's an engine rattling sound, if vibration is high, or if something's giving out an alarm, we don't want to get this wrong.

WSJ: What's a typical day like?

DR. NARASIMHAN: I build my models and run them and make predictions and get results and then go to my customers and clients [and talk about] what it means. So for vehicles that contain parts that GE makes, how frequently do you do inspections? These engines are becoming smarter, and they generate a lot more data than there used to be before. As long as I or another data scientist has the data, we can make predictions.

Data scientists need to be curious and ask the right questions. You have to understand the signal and the noise, and math and all of that helps.

I like to work on more than one project, so I would be involved in a number of meetings or design discussions. A lot of my day is spent in phone calls talking with others, and GE is wonderful that way. [You can talk to the person] who designed something, and they know what this column of data means. Then I keep up with videos and course work and go to as many seminars as I can. I live in the South Bay, and all the good seminars tend to be in this area.

And there are meetups. Not a week goes by when I've not attended at least one tech talk.

WSJ: What was the most surprising bit of insight or knowledge that you've gained?

DR. NARASIMHAN: Before going in, we have human intuition and think we know what we're going to find, and [sometimes] the results are different. We were finding out in aviation that with aircraft engines, sometimes performance degrades in high-pollutant areas where there's particulate matter and fog or sand clogging up small holes that we didn't even know were there in fancy propellers and blades. By doing something as simple as a water wash, if you do it frequently, predictive failure rates go down. We had a lot of data and were looking for what makes a difference. We didn't go looking for one thing, we were looking at 100 things, and water wash stood out. These kinds of things make your day.

Changes ahead

WSJ: How do you think data science will change in the next five years?

DR. NARASIMHAN: I'm now coming to the feeling that data science is no longer a zero or one thing, where you either are or are not a data scientist. All of us, whether we have the title or not, are making data-driven decisions. All of us are getting savvier.

I think techniques in data science are becoming more commoditized and are applicable to more of us, like in fantasy sports with the handicapping of different games or in making our own financial decisions. Take shopping. We want to buy the same thing our friends are buying, and we want the absolute lowest price we could find. Amazon has done this to some extent, but even when we know something is on sale for just an hour, there could be enough tools listening to do that.

Data science will percolate into all of our daily lives. Pick dating and online relationships. Think of when you get profiled—if an algorithm picks a partner, she will have certain attributes and it's probably a good [match]. If any field today is not data driven, those are ripe for disruption.

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