



## **Keep Your Old Career Hot in the New Age of Data Science**

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Data scientists, upon the wings of media hype, are bombarding us with mystical jargon such as machine learning, artificial intelligence, big data, algorithms, etc., and model types with geek-like names. We are also being made to believe that our firms must invest hugely in sci-fi like computer infrastructure. Meanwhile, surveys are telling us that data science is the new hot career; making us wonder if ours will grow cold.

History shows clearly that all technological advances create winners and losers. So what if you are not a data scientist and never will be? Where do you fit in? Will you be left behind to become irrelevant in the new age?

These are scary questions because, for most of us, our current skills place us on the outside looking in at the new age of data science. However, some of us can remember that, once upon the time, the same could have been said about MS Excel skills.

The reality is that your firm is at risk of being left behind. You as a business operative, manager or subject matter expert, rather than data scientists, will decide whether that happens.

This is because the analytics of data science must be applied by people such as yourself whose careers have been the firm's business processes. Data scientists do not and never will have your expertise. In other words, nobody can work your Rubik's Cube but you.

Our firms are dependent upon our actions to up-skill the expertise of our careers as necessary to sweep them into the new age of achievable business performance. Taking action begins with understanding what you must do to get there. That is the purpose of this article.

### **It's a Straightforward Analytic to Five Questions**

The first thing to understand is that all of data science is essentially the same straightforward analytic. The analytic is largely the same across a broad range of models. The models as

machine learning (aka, AI) are fed a big chunk of data and then their gut “algorithms” (calculation steps) work by trial-and-error until they “learn” what is the best fit to the data.

You must up-skill yourself to know which models ask particular types of questions and how to read the fit as the answers to the questions. The range of models variously boil down to asking and answering five types of fundamental questions in the design and conduct of business operations.

The five types of questions are as follows and the associated models to each are explained via the provided links:

- **Relationship**: Which asset and process variables are most strongly related to a performance of interest?
- **Difference**: How do slice-dice combinations of asset and process variables comparatively effect a performance of interest?
- **Time series**: What are the components that underlie the summary-level-only history that operating systems are limited to providing?
- **Duration**: What is the probability an asset or process condition will hold for some time and then what is the probability the condition will end?
- **Apparency**: Are there hidden predictor variables to the performance of assets and processes?

Upon inspection, it is clear why your firm will be left behind until you, as its operatives, managers and SMEs, find a way to up-skill your career expertise to ask and answer the five questions. Your skills will be the insight that firms could not operate by before. Without them, your firm will continue to function on considerable intuition and misleading information.

### **Infrastructure is Not a Barrier**

The next thing you need to know is that high-tech, big-dollar infrastructure does not stand in the way of up-skilling your career expertise to work the five questions. The only infrastructure you need is your notebook computer into which the free top-tier software known as R ([r-project.org](https://www.r-project.org)) has been downloaded.

Think of the R software as akin to the packaged models we are already universally familiar with—the MS Excel functions (algorithms) we setup through their arguments. Just as for the Excel functions, the models of data analytics are functions that were at some time developed and packaged by data scientists. And just as for Excel functions, we do not need to be data scientists to work them.

## Personal Up-Skill Initiative

What must be your most urgent professional goal going into the new age of data science is clear. You must find a path to up-skill yourself to work the five questions. Hopefully, your firm will share your sense of urgency.

The shortest path is to be assigned to operations improvement projects for which management has mandated that its stages shall be up-skilled to work the five questions. The article, "[DMAIC Done the New Age Way](#)," describes how the five questions are woven into Lean Six Sigma projects while up-skilling the team members as the stages unfold. However, regardless of the type and purpose of the project, an up-skilled operational excellence professional, such as myself, is assigned to the project team as a player-coach to the team members as they work the five questions.

What if you do not have the opportunity to join an up-skilled project? If you are not so fortunate, what you must learn as your personal up-skill initiative is specifiable. You must find a place to learn the types of models that serve each of the previously listed five questions. The links at each question will take you to an article that identifies and explains the enabling models.

If you are a self-directed learner, the models to work the questions can be found in the list of literature placed at the end of this article. They collectively explain all of the models and demonstrate them using the R software. At the other end of the spectrum are formal online certificate programs at universities, such as Texas A&M Department of Statistics. In between are online training such as those offered free by Coursera.

The payoff for your career will be quick along whatever path you take. As you learn each model, your career will soar upon the wings of the questions you will thence normally ask and answer in the design and function of your business operations.

**Sources for self-directed learning:** *Discovering Statistics Using R*, Field and Miles, 2012 | *Multilevel Modeling Using R*, Holmes, 2014 | *Machine Learning with R*, Lantz, 2015 | *ggplot2, Elegant Graphics for Data Analysis*, Wickham, 2016 | *Introductory Time Series with R*, Cowpertwait and Metcalfe, 2009 | *Event History Analytics with R*, Bostrom, 2012 | Package "tsoutliers," Javier López-de-Lacalle, 2017

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