

## 3 Steps for Building a Strong Data Science Team

Do you feel like you are pulling your hair out trying to hire and maintain a data science and analytics team in 2019? Join the club! Just six years ago, the Harvard Business Review dubbed the role of Data Scientist “[The Sexiest Job in the 21st Century](#)”. Since then, the job shows no sign of losing its, err, sex appeal.

In 2019, much to the dismay of the world’s employers, **Data Scientist**, and related analytics roles still retain their “sexy” status. Bloomberg calls the role of Data Scientist “[America’s Hottest Job](#)”. Glassdoor included eight analytics roles among its 50 best jobs in America and crowned the Data Scientist role as the “[Best Job in America](#)”. It’s clear why - Data Scientist jobs are commanding a median salary of \$110,000. Salaries can reach as high as \$300,000!

The boom in demand for **Data Scientists** and employees with deep analytical skills, coupled with the cross-functional skills typically needed to fulfill such roles, continues to fuel a challenging environment for employers seeking high caliber **Data Scientists and Analytics** professionals. Note the term “high caliber”. In part because of the hype and excitement around data science roles, every grad who has taken a statistics course is eager to put “Data Scientist” on their resume. Nanodegree programs are popping up everywhere promising to create a Data Scientist in just 90 days - with no money-back guarantee!

Post a Data Scientist or Analytics job opening on any leading job board. You will likely be flooded with applications from aspiring candidates of all walks of life wanting to work in the sexiest job of the 21st century.

In this article, we explore the current landscape for hiring **Data Scientists** and other **Analytics** professionals. We identify key demand and supply side drivers that are driving the gap between job openings and job fillings. We look at how this shortage has evolved in recent years and how it is expected to evolve. Given this landscape, we then propose steps employers can take to succeed in building a data science team in this challenging recruitment environment.

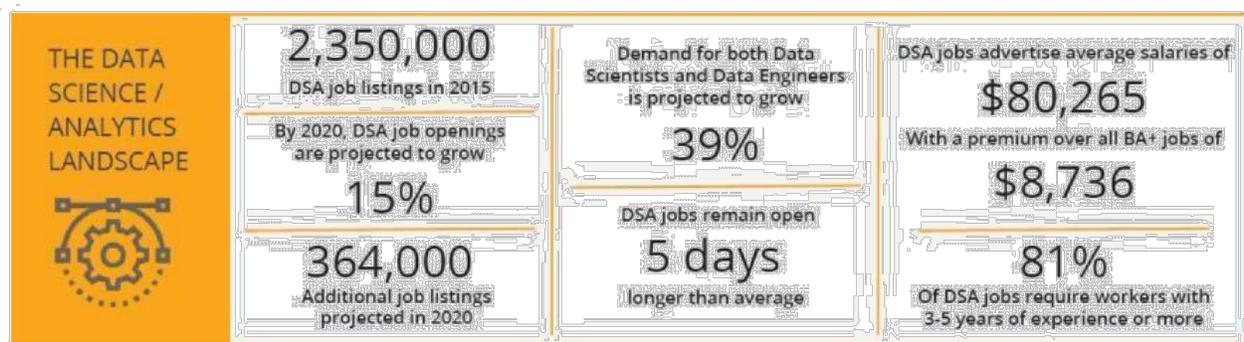


## Is There *Really* A Shortage of Data Scientists - Still?

We know, you've been hearing that there has been a shortage of Data Scientists and Analysts since the dawn of time. Surely the brains of industry have resolved the problem by now? Here are some "shortage facts" that have appeared in recent years.

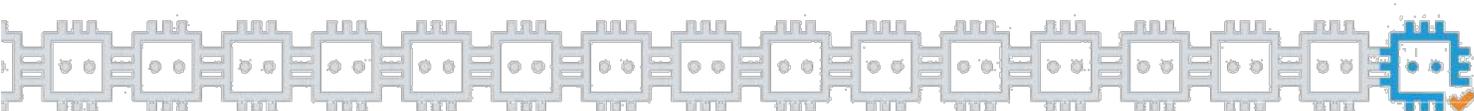
- 2011 - The [McKinsey Global Institute](#) predicted a shortage "of talent necessary for organizations to take advantage of big data". It forecast that by 2018, there would be 190,000 unfilled data analytics positions and a shortage of 1.5 million managers and analysts who have the ability to understand and use data/analytics.
- 2012 - Gartner predicted a national shortage of 100,000 Data Scientists by 2020.
- 2014 - Accenture found more than 40 percent of its clients cited a data talent shortage as an obstacle to taking advantage of big data.
- 2016 - A CrowdFlower Data Science Report revealed that 83 percent of survey respondents cited a shortage of data scientists.
- 2018 - An IBM sponsored report entitled "[The Quant Crunch](#)" predicts that the number of job listings requiring data and analytics skills will grow 28% to 2.72 million job listings (USA only) by 2020.

The infographic below that accompanies this assessment perhaps best summarizes the current situation.



[Image source](#)

Note the extra 5 days on average that's required to fill **Data Scientist and Analyst** positions and the +\$8,000 premium a candidate can obtain. 81% of data science and analytical jobs require significant experience - which is no doubt why some Ph.D. positions command as much as \$300,000 or more. Longer recruitment time, high salaries, premiums, required experience, all of this points to, you guessed it - a shortage.



## After Years of Big Data, Why Is There Still A Shortage?

Any shortage is driven by supply and demand. Let's first understand the market demand factors at play.

### Swift Technological Change

The pace of technological change, particularly in the field of data science, analytics, and artificial intelligence, is incredibly fast. New technologies regularly bring new skill requirements. Standard SQL remains an in-demand skill for many analytical roles, but skills related to new technologies such as Python, Tensorflow, and Keras, are among the fastest growing in terms of demand. The boom in unstructured data analytics such as sentiment analysis, image processing, and video analysis, is another example of technology mandating new skill sets. These advancements create a significant skills gap in the market and their pace of change makes it even more difficult for companies to find a Data Scientist with the unique combination of skills required for a particular position.

### Business Intelligence 101

Tools such as [Google Analytics](#), ERPs that produce advanced but easy to use visualization tools, and business intelligence tools such as Sisense enable non-technical employees and managers to access, view and present data in new ways. The utility of these tools is driving demand for data science and analytical skills in new areas of businesses. Take Human Resources for example. The folks in HR now want to measure employee engagement in real time and on a daily basis. They need data skills to do this.

### Growing Overlap of Skills Requirements

Data Science and related analytical roles have always required a loosely defined overlap in skills such as advanced math, statistics, programming, and data management. More and more, jobs in the data science field require a growing mix of competencies. Skill sets needed for a single job can range from creating sophisticated predictive or prescriptive models, to leveraging data sets or generating insights, to overseeing analytical operations. A newer breed of "hybrid" jobs require deep expertise in one or more domains along with a variety of data skills. For example, a Marketing Analytics Manager requires advanced analytical techniques with deep marketing domain knowledge. These specialized groupings of skills make it really hard to find a candidate that "fits".



## Data Analytics = Profits

A few years ago, [an MIT study](#) caught the industry's attention when it found that data-driven companies were on average 4% more productive and 6% more profitable. Amazon, Google, Netflix, and Facebook are also living proof that data science works. Now everybody wants to be a "data-driven company". Even GE, one of the oldest companies around, is betting its future on data by saying, "We want to treat analytics like it's as core to the company over the next 20 years as material science has been over the past 50 years."

These demand factors on their own are probably enough to create a shortage of [Data Scientists](#), but on the supply side, the picture is not so rosy either.

## Bachelor of Data Science - Not Needed!

Even though Stanford, Cornell and a host of other universities now offer master's degrees in data science, undergraduate degree programs in Data Science have only recently appeared. Data Scientists gain their skills through self-preparation and learning by doing tactics. A recent survey of Kaggle users indicated that a whopping 66% described themselves as self-taught. Candidates from related fields like economics, physics, and mathematics are trying to acquire data skills through rogue methods as well. Can you think of any other technical field that has such a huge percentage of self-taught experts that command a \$100,000 salary? The issue for employers is to identify which of these self-trained Data Scientists have the requisite skills to merit the high salary.

## Experience Required!

According to the Quant Crunch study, a whopping 81% of Data Science and Analyst jobs require three to five years of experience and 39% require a master's or Ph.D. In today's world, who has the time or money for that much education? It will take a significant time for the market to produce and train a larger pool of such experienced talent.

## A Lifetime of Learning

The Quantcrunch study identified over 300 data and analytical competencies that are requested in the current market. This means that Data Science and Analytics are a career that will necessitate lifetime learning and development, especially with the rapidly evolving nature of data-related technologies and Artificial Intelligence. Until companies recognize the need to invest in ongoing educational support and development of Data Scientists, certain skill sets will continue to be scarce.

## What is a Data Scientist Anyway?

For years many have asked this question. To this day no common industry or academia agreement exists to denote exactly what a Data Scientist is and what they should be able to do. New positions, such as Data Scientists and Data Engineers, are not even tracked in labor statistics. Job titles and associated skill sets are not consistent across many Data Science and Analytics positions. It is difficult to hire for a job that is not defined - plain and simple.

## Shortage or Not, Retention is a Problem!

So, a salary of \$100,000 a year should guarantee any employer some degree of loyalty, right? Despite the high pay, studies show that Data Scientists are not all happy in their roles. Kaggle found that most people working in the field of Data Science spend 1-2 hours a week looking for a new job.

There are numerous reasons for job dissatisfaction and turnover amongst Data Scientists. One factor is that companies do not know how to go about setting up a Data Science and Analytics department (read on for more about how you can do that!). They do not know what skills they need and for what objectives. They end up hiring Data Scientists and Analysts without being properly prepared to provide the necessary job environment for success.

New Data Science recruits are often handed poor quality data that is incomplete, lacking in integrity, or which poorly represents data samples. Because these recruits have to deal with these issues on their own before they can do the job they were hired for, they become disconnected. It seems easier to look for a better job, or just snag that other job offer that was made last week, than to clean data.

You might as well accept that any analytics employee you have is either trolling job boards weekly or being contacted by recruiters and friends in the business who are offering them new opportunities just as often.

## This Seems Bleak - How Do I Build My Team?

It's not as simple as just posting positions on leading job boards and pitting your hiring hopes on the fact that this job is "sexy". Good Data Scientists have a multitude of options and as we've discussed, there aren't enough of them around. You need to be very strategic in your approach and recognize that this is





a chicken-and-egg problem. Without a well thought out, clearly articulated, vision and strategy for Data Science and Analytics, how will you attract (and retain, for that matter) top-notch talent?

Beyond that, without a clear determination of the roles that you want to fill, and the skill sets needed for those roles, how will you be sure that you are actually hiring the right people? Lastly, without a plan for challenging and developing your data team, how will you maintain an engaged group who stay with you for the long haul, and thus avoid being right back at square one facing the dreaded hiring conundrum?

At QuantHub, we've learned several lessons on this topic over the years and have come up with what we believe to be a winning approach for creating a world-class data science and analytics organization. It is broken down into three high-level themes:

Before reading our 3 high-level themes, why not drop us a follow on [Twitter](#)?

## Theme #1 - Create and Communicate Your Data Science Vision & Strategy

### Layout a vision for data science and analytics

Determine your “true north” for data science and analytics - the direction you should always be striving towards with your projects and initiatives. Consider the vision in terms of what the future could look like once you're successful. Spend every day reinforcing and evangelizing that vision to management.

### Take stock of the current state of your data

In order for you to be able to create a plan and strategy for your team, it's absolutely critical to first understand the current state of your data. This can have major ramifications on your approach to delivering the vision.

### Map out a high-level strategy and plan for delivering on your vision

Now that you know your vision and your current state, come up with a high-level strategy and plan for delivering on the vision. At this stage, it's difficult to know all the details but having a high-level strategy will help you define the initial steps to take and will also inform decisions around team structure, skillsets, etc.



## Theme #2 - Create and Implement a Strategy for Organizing & Staffing the Team

### Map out the roles and skillsets needed for the team

Depending on your current state and strategy, determine which roles you need to fill upfront and what skill sets are needed for those roles. It's also particularly useful to prioritize skill sets. Use this information to craft your recruiting candidate evaluation process so that when you hire someone, you are confident they have the right skills for the job, and they have proven to you that they can tackle the responsibilities associated with it.

### Consider filling out the team internally

Many experts, including Tom Davenport, author of the famed 2012 HBR article, make the point now that there would be little shortage of Data Scientists and Analysts if companies would re-educate their current employees on data science. The first step in this effort is to conduct skill evaluations for each of your analytically inclined team members to determine those that can make the leap into data science and analytics roles with additional training and experience. You're likely to find these team members in fields such as Economics, Finance, Engineering, and Physics.

### Consider college recruiting from data science and analytics degree programs

According to the data science community, there are over 500 degrees in and around Data Science and Analytics, creating tens of thousands of new data scientists every year. In order to put yourself in a good position to attract and hire the top graduates, consider internship programs with schools in your regional area. Partner with professors to offer students the ability to work on your data (free data cleaning!) and projects during their hands-on classes, and research projects. No amount of marketing can surpass the positive impression you can leave with students who have the opportunity to work for you as an intern or experience your data strategy firsthand during their studies.

### Hire externally, but network, network, network

It's nearly a given that you will need to do some amount of hiring externally. The question is about your approach - how do you find the best fit? Given the speed of technological change happening in this field and the relative newness of many people within it, there is a tremendous amount of networking happening in the data science community. It might not be traditional networking where you stand around at an event uncomfortably trying to find someone to talk to - rather this networking is squarely focused on finding new and creative ways to solve problems and challenges. Sites like Kaggle have a tremendous community of data scientists working on challenges every day. Consider spending more





time networking in your external search to seek out and identify the best potential candidates for your team.

### Theme #3 - Challenge, Develop, and Retain the Team

#### Lead with context and challenge your team

Most data science professionals, by nature, are problem solvers. It's up to you to clearly articulate the problem you are trying to solve - it's perhaps the most critical of the c-words: CONTEXT! Give your team extreme clarity into the problem and then challenge them to solve it. There's almost no better way to engage technologists than to clearly articulate a customer problem and then challenge them to solve it.

#### Commit to developing your team members and expanding their capabilities

The best data scientists are committed to lifelong learning and will become disengaged in environments in which they aren't learning. Armed with this knowledge, consider implementing a program focused on continuously evaluating your team members to determine their strengths and growth areas, then work with them to create a development plan to build on their strengths and fill in any knowledge gaps. Investing in your team in this manner will not only keep them engaged, but it will ultimately keep them around for a longer time!

So, now that you have an idea of the challenging landscape for hiring Data Scientists in 2018 and beyond, and some steps you need to take to make that happen successfully for your organization, you may be wondering how to get started building your Data Science and Analytical team. [QuantHUB](#) has the exact solution for you. We can help you attract, vet, and develop your quantitative team with confidence. Try our platform and start building a world-class Data Science and Analytics team!

