

Data Scientists

Labor Market Analysis: San Diego County

November 2018

Summary

According to available labor market information, there is labor market demand in San Diego County for *Data Scientists*. This occupation's entry-level and median wages are higher than the Self-Sufficiency Standard, suggesting that students who successfully complete a program and obtain employment in a related field may earn living wages. According to online job postings and a recent survey by the San Diego Regional Economic Development Corporation (EDC), employers expect job applicants for *Data Scientists* to have bachelor's, master's or doctoral degrees. As a result, programs offered in the county and online focus on graduate-level coursework. If a community college certificate program were to be developed for *Data Scientists*, the labor market analysis suggests that the program should be marketed to working professionals (or incumbent workers) in the field for "upskilling" or supplementing their prior education and training. Another option would be to develop an Associate Degree for Transfer (ADT) program for this occupation at the community colleges due to its educational requirements.

The following list summarizes findings from the labor market analysis below for *Data Scientists*:

- According to a small survey by the EDC, 16 firms reported having an aggregated labor market demand of 210 unfilled positions for *Data Scientists* as of fall 2018. The employers surveyed expect to hire 340 more *Data Scientists* in the next three years.
- Between 2010 and 2017, there was an average of 119 online job postings per year for jobs with the keyword "Data Scientist" in San Diego County.
- *Data Scientists* earn median hourly earnings of \$44.82; this is higher than the Self-Sufficiency Standard for a single adult in San Diego County, which is \$15.99 per hour.
- University of California, San Diego (UCSD), San Diego State University, University of San Diego, and National University offer master's degree programs in data science in San Diego County. UCSD Extension offers 10 data science certificate programs, but no awards have been reported. There are more than 20 online certificate programs for data science, primarily in graduate coursework.

- Between January 1, 2015, and December 31, 2017, the top employers that posted jobs online in San Diego County for “Data Scientist” were Booz Allen Hamilton Inc., Teradata Operations, Inc., Accenture, Intel Corporation and Id Analytics, Inc.
- The top listed educational requirement for “Data Scientist” is a master’s degree.
- The top skills for *Data Scientists* are Python, R, SQL, Java, Apache Hadoop, and MATLAB.

Introduction

This report provides labor market information in San Diego County for *Data Scientists*. *Data Scientists* utilize analytical, statistical, and programming skills to collect, analyze, and interpret large data sets.¹ They can be responsible for modeling complex scientific problems, discovering insights, and identifying opportunities through the use of algorithmic, mining, and visualization techniques. *Data Scientists* use a variety of technical skills including statistics, coding languages, machine learning, databases, and reporting technologies.

Projected Occupational Demand

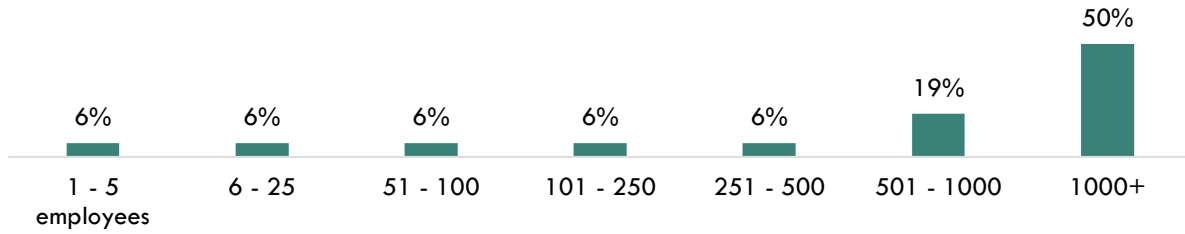
Typically, labor market demand for an occupation could be projected if the occupation has a code within the Standard Occupational Classification (SOC) system. The SOC system is a federal standard system that classifies workers in occupational categories. Because there is no SOC code associated with *Data Scientists*, no SOC-projected occupational demand is provided in this report. However, the closest SOC code to *Data Scientists* is *Computer and Information Research Scientists* (SOC 15-1111), and a report for this occupation can be found on the Centers of Excellence for Labor Market Research (COE) website, coeccc.net.

Though there is no data in the SOC system, a recent report from Burning Glass Technologies, Business-Higher Education Forum (BHEF), and IBM projects that employment for *Data Scientists* will increase by 13,452 jobs or 28 percent nationwide between 2015 and 2020.² In San Diego County, the San Diego Regional Economic Development Corporation (EDC) completed a small survey of 16 companies that currently employ *Data Scientists*. Of the 16 firms surveyed, the majority have more than 1,000 employees in the county, with 44 percent of the firms employing at least 26 *Data Scientists* (Exhibit 1).

¹ Data Scientist Job Description. (glassdoor.com/Job-Descriptions/Data-Scientist.htm).

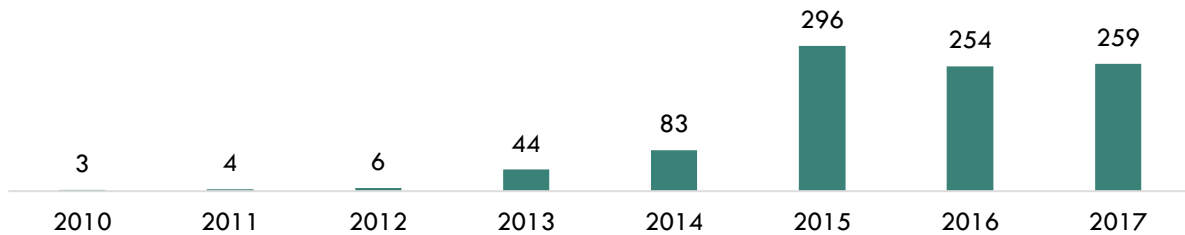
² The Quant Crunch: How the Demand for Data Science Skills is Disrupting the Job Market. (-01.ibm.com/common/ssi/cgi-bin/ssialias?htmlfid=IML14576USEN)

Exhibit 1: Company Size by Number of Employees in San Diego County Firms Surveyed about Employment for Data Scientists (n=16)³



The 15 firms reported having an aggregated labor market demand of 210 unfilled positions for *Data Scientists* as of fall 2018. The employers surveyed expect to hire 340 more *Data Scientists* in the next three years.⁴ This number is consistent with the number of online job postings for *Data Scientists* in San Diego County; there were more than 200 postings for *Data Scientists* each year between 2015 and 2017. Between 2010 and 2017, there was an average of 119 online job postings per year for jobs with the keyword “Data Scientist” in San Diego County (Exhibit 2).

Exhibit 2: Number of Online Job Postings for Data Scientists in San Diego County (2010-2017)⁵



Earnings

Data Scientists earn median hourly earnings of **\$44.82**; this is higher than the Self-Sufficiency Standard for a single adult in San Diego County, which is **\$15.99** per hour (Exhibit 3).⁶

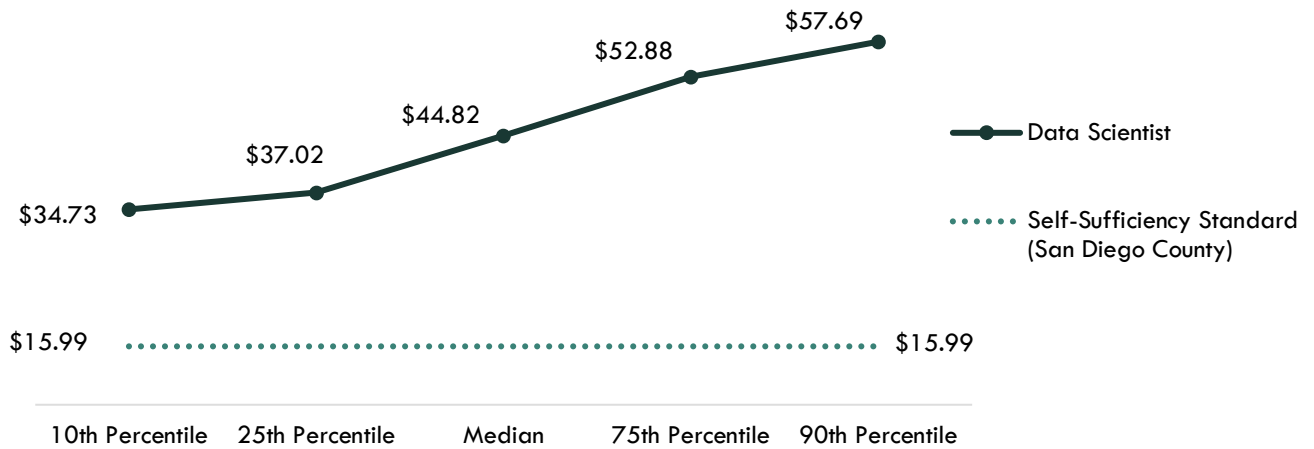
³ San Diego Regional Economic Development Corporation. Data Science Survey. September 2018.

⁴ San Diego Regional Economic Development Corporation. Data Science Survey. September 2018.

⁵ Labor Insight Jobs. Burning Glass Technologies. San Diego, CA. Full years 2010-2017.

⁶ The self-sufficiency wage in San Diego for one adult is \$15.99 (insightcced.org/2018-self-sufficiency-standard).

Exhibit 3: Hourly Earnings for *Data Scientists* in San Diego County⁷



Supply

Educational supply for an occupation can be estimated by analyzing the number of related program completers/graduates/awards in San Diego County. According to the California Community Colleges Chancellor’s Office Management Information System (MIS) Data Mart, there are no community colleges in the county that supply awards for *Data Scientists*.

University of California, San Diego (UCSD), San Diego State University, University of San Diego, and National University offer master’s degree programs in data science in San Diego County. UCSD Extension offers 10 data science certificate programs, but no awards have been reported.⁸ Furthermore, there are more than 20 online certificate programs for data science, primarily focused in graduate coursework.

Demand vs. Supply

A complete labor market demand and supply analysis could not be completed for this report due to lack of data. However, based on online job postings and the EDC survey for *Data Scientists*, it could be estimated that there is a labor market supply gap of more than 100 *Data Scientists* per year.

⁷ PayScale Data Scientist salary in San Diego (payscale.com/research/US/Job=Data_Scientist/Salary/3fb953b4/Entry-Level-San-Diego-CA).

⁸ Certificates and Programs at the University of California San Diego Extension. (extension.ucsd.edu/courses-and-programs/data-science-courses)

Top Employers and Work Locations

Between January 1, 2015, and December 31, 2017, the top employers that posted online job postings in San Diego County for “Data Scientist” were [Booz Allen Hamilton Inc.](#), [Teradata Operations, Inc.](#), [Accenture](#), [Intel Corporation](#) and [Id Analytics, Inc.](#) (Exhibit 4).⁹

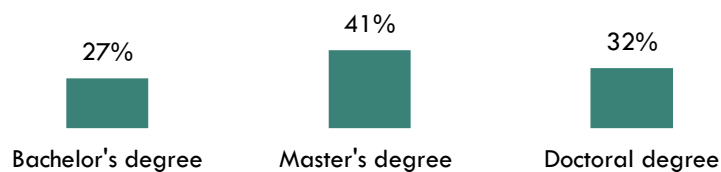
Exhibit 4: Top Employers in San Diego County with Online Job Postings for *Data Scientists*

Top Employers	
<ul style="list-style-type: none">• Booz Allen Hamilton Inc.• Teradata Operations, Inc.• Accenture• Intel Corporation• Id Analytics	<ul style="list-style-type: none">• Intuit• Cymer, LLC• Illumina, Inc.• CA Technologies

Skills, Education, and Certifications

Because there is no SOC code associated with *Data Scientists*, no national educational attainment data is provided in this report. (National educational attainment data illustrates the typical education obtained by individuals employed in a specific occupation.) However, based on online job postings between January 1, 2016 and December 31, 2017, the top listed educational requirement for “Data Scientist” is a [master’s degree](#) (Exhibit 5).¹⁰

Exhibit 5: Educational Requirements for *Data Scientists* in San Diego County Based on Online Job Postings



Educational requirements in online job postings are similar to the employer responses from the EDC survey for *Data Scientists*. According to the survey, companies reported that 94 percent of entry-level positions for *Data Scientists* will require a bachelor’s degree or higher (Exhibit 6).

⁹ Burning Glass Technologies. San Diego, CA. Full years 2015-2017.

¹⁰ Burning Glass Technologies. Occupational Deep Dive. San Diego, CA. Full year 2016-2017.

Exhibit 6: Educational Attainment Expected of *Data Scientists* from Employer Survey Responses San Diego County (n=16)¹¹

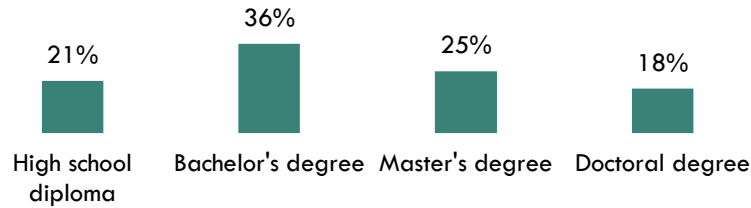


Exhibit 7 lists the top specialized, soft, and software skills that appeared in jobs online between January 1, 2015 and December 31, 2017.

Exhibit 7: Top Skills in Online Job Postings for *Data Scientists* in San Diego County¹²

Specialized Skills	Soft Skills	Software Skills
<ul style="list-style-type: none"> • Data Science • Machine Learning • Data Mining • Big Data • Data Analysis 	<ul style="list-style-type: none"> • Research • Communication Skills • Creativity • Teamwork / Collaboration • Problem Solving 	<ul style="list-style-type: none"> • Python • Apache Hadoop • SQL • R • Java

The specialized skills listed on online job postings are similar to the employer responses from the EDC survey for *Data Scientists*. Employers surveyed expect job applicants for *Data Scientists* to have the following specialized skills:

- Machine learning
- Predictive analytics
- Algorithm development
- Advanced statistics and math
- Data mining
- Data visualization
- Data wrangling
- Full stack development
- Experience using publicly available data sets
- Project management
- Database management

¹¹ San Diego Regional Economic Development Corporation. Data Science Survey. September 2018.

¹² Labor Insight Jobs. Burning Glass Technologies. San Diego, CA. Full years 2015-2017.

Additionally, employers surveyed expect job applicants for *Data Scientists* to have knowledge of Python, R, SQL, Java and MATLAB, which is similar to the software skills in online job postings for *Data Scientists* (Exhibit 8).

**Exhibit 8: Software Skills Expected of *Data Scientists* from Employer Survey Responses
San Diego County (n=16)¹³**



(Employers could select more than one software skills and therefore the percentages will not add up to 100%.)

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Important Disclaimers

All representations included in this report have been produced from primary research and/or secondary review of publicly and/or privately available data and/or research reports. This study examines the most recent data available at the time of the analysis; however, data sets are updated regularly and may not be consistent with previous reports. Efforts have been made to qualify and validate the accuracy of the data and the report findings; however, neither the Centers of Excellence for Labor Market Research (COE), COE host district, nor California Community Colleges Chancellor's Office are responsible for the applications or decisions made by individuals and/or organizations based on this study or its recommendations.

¹³ San Diego Regional Economic Development Corporation. Data Science Survey. September 2018.