

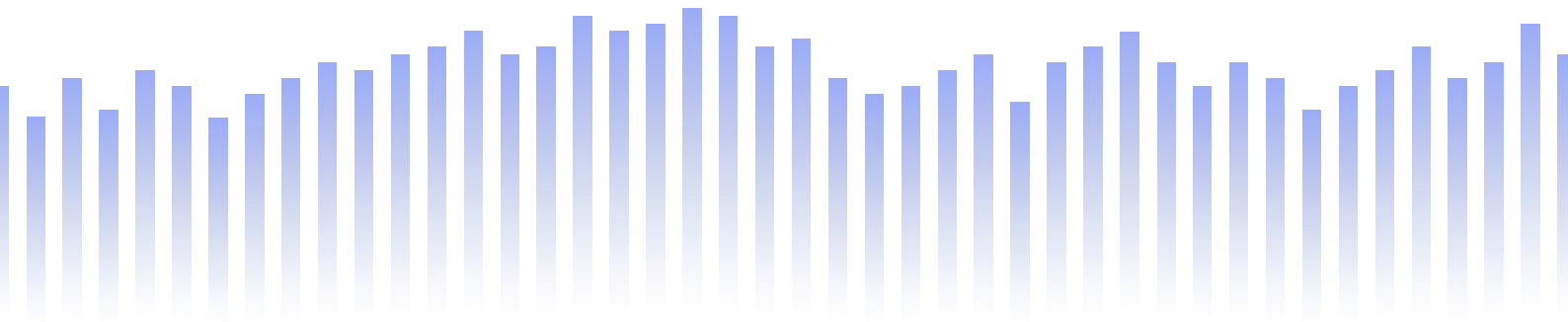
# DATA SCIENCE AND ANALYTICS

CAREER GUIDE

# INTRODUCTION

Data Science continues to be a hot topic among skilled professionals and organizations that are focusing on collecting data and drawing meaningful insights out of it to aid business growth.

A lot of data is an asset to any organization, but only if it is processed efficiently. With the advent of the age of Big Data, the traditional Business Intelligence tools started falling short for processing this massive pool of unstructured data. Hence, Data Science came in with more advanced tools to work on large volumes of data from multiple sources - financial logs, multimedia files, marketing forms, sensors and instruments, text files, and more.



## WHAT IS DATA SCIENCE?

Data science is a broad field of study aimed at maintaining data sets and deriving meaning out of them. The unique combination of statistics, mathematics, and business domain knowledge offered by Data Science has the potential to help organizations find ways to reduce costs, get into new markets, tap on different demographics, gauge the effectiveness of marketing campaigns or launch a new products and services.

# APPLICATIONS OF DATA SCIENCE

Given the importance of data in today's world, companies are utilizing insights from data to make strategic business decisions, build applications, and provide solutions. As a result, Data Science has many applications and use-cases. A few of them are:



## Weather Forecasting

Data Science has myriad applications in predictive analytics. In the specific case of weather forecasting, data is collected from satellites, radars, ships, and aircraft to build models that can forecast weather and also predict impending natural calamities with great precision. This helps in taking appropriate measures at the right time and avoid maximum possible damage.



## Cyber Security

Big data comes with big threats, thus making it mandatory for all to leverage data science in order to mitigate cyber security risks. Employees, especially in research and development domains, are expected to know all about the technological aspects of handling cyber-attacks. For example, IBM has quickly capitalized on the potential of analytics and cyber security to introduce hundreds of security products.



## Healthcare

From medical image analysis, cancer detection and care, genomics, drug discovery, disease prediction and prevention, monitoring patient health are just few of the applications of Data Science to healthcare. The medicine and healthcare industry are heavily utilizing Data Science for improving patient lifestyle and predicting diseases at an early stage.



## Talent Acquisition

Talent Acquisition is now uses data science to make informed decisions. Big data helps identify red flags during the hiring process, as a result, the cost of acquiring new employees and training them goes down. Research suggests that a staggering 69% of talent acquisition professionals still make use of age-old operational methods such as spreadsheets and other ad-hoc tools to maintain databases, hence the vast scope of data science.



## Fraud and Risk Detection

Some of the major applications of Data Science are in the Finance and Insurance sectors. They utilize big data and data science techniques to identify patterns of fraudulent transactions, predict the next fraud in progress, and notify both the bank and customers, saving responsive measures later on. Anti-money laundering incidents are on a high; but with analytics, non-compliance fines can be easily implemented and reputation loss risk mitigated.



## Recommendation Engines

Recommendation engines are quickly becoming a standard in retail and ecommerce. Retailers leverage these engines to drive a customer towards buying more products. While traditional models drew insights out of browsing history, purchase history, and basic demographic factors; with data science, vast volumes and variety of data can train models better and more effectively to show more precise recommendations.



## Customer Sentiment Analysis

Customer sentiment analysis has been around for a long time. But now, machine learning algorithms help simplify, automate, and save a lot of time while giving more accurate results. Social media is the most readily and easily available tool for analysts to perform customer sentiment analysis. They use language processing to identify words bearing a negative or positive attitude of the customer towards the brand. This feedback helps businesses improve their products.



## Inventory Management

Inventory management is crucial for businesses to optimize resources and increase sales. Powerful machine learning algorithms analyze data between the elements and supply in great detail and detect patterns and correlations among purchases. The analyst then analyzes this data and comes with a strategy to increase sales, confirm timely delivery and manage the inventory stock.



## Price Optimization

Selling a product at the right price is a crucial decision for a business. Price Optimization uses Machine Learning models to determine the optimal price of products using parameters such as competition, operating costs, market demand, company objectives, etc. and are a powerful tool for retailers.



## Self-driving Cars

Intelligent cars are a classic example of Data Science. An intelligent vehicle collects data in real-time from its surroundings through different sensors like radars, cameras, and lasers to create a visual (map) of its surroundings. Based on this data and advanced Machine Learning algorithms, it takes crucial driving decisions like turning, stopping, speeding, etc.

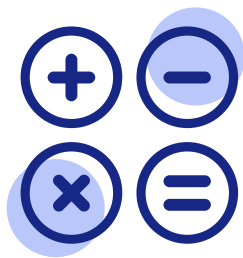


# SKILLS NEEDED TO BE A DATA SCIENTIST

Data Science is a multidisciplinary subject and it is a big misconception that one needs to have a Ph.D. in science or mathematics to become a data science professional. Although a good academic background is a plus when it comes to data science profession, it is certainly not an eligibility criterion. Anyone with a basic educational background and an intellectual curiosity towards the subject matter can become a data scientist.

Here are a few valuable skills required for data scientists to inculcate before hitting the marketplace looking for the ideal job.

## Mathematical Expertise



There is a misconception that Data Analysis is all about statistics. There is no doubt that both classical statistics and Bayesian statistics are very crucial to Data Science, but other concepts are also crucial such as quantitative techniques, and specifically, linear algebra, which is the support system for many inferential techniques and machine learning algorithms.

## Strong Business Acumen

Data Scientists are the source of deriving useful information that is critical to a business, and are also responsible for sharing this knowledge with stakeholders to be applied in business solutions. They are critically positioned to contribute to the business strategy as they have the exposure to data like no one else. Hence, data scientists should have a strong business acumen to be able to fulfil their responsibilities.

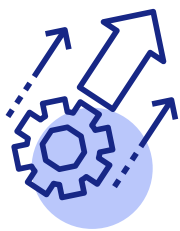
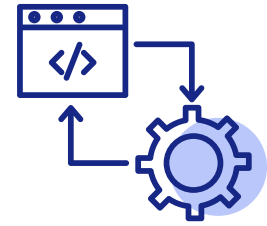


## Problem-Solving and Risk Analysis Skills

Data scientists need to maintain exceptional problem-solving skills and master the art of calculating the risks associated with specific business models.

## Technology Skills

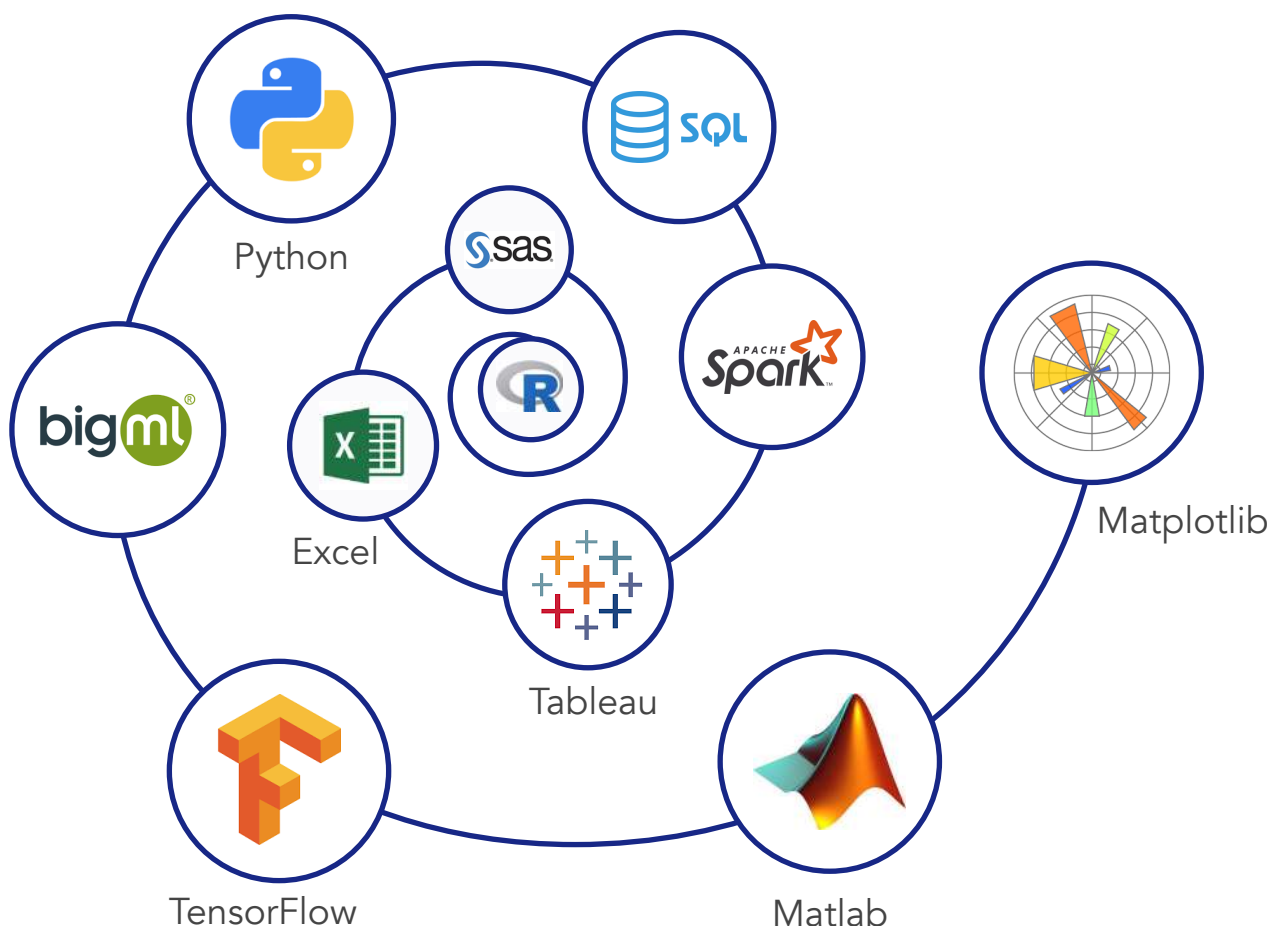
Data Scientists are required to work with complex algorithms and sophisticated tools. They are expected to code and prototype quick solutions using one or a set of languages from Python, R, SAS, SQL, and sometimes Java, Scala, Julia and others. Data Scientists should also be able to navigate their way through technical challenges that might arise and avoid any bottlenecks or roadblocks that might occur due to lack of technical soundness.



## Process Improvement Skills

It makes a lot of sense for data scientists to develop a personalized approach to improving processes. As organizations move closer to transformation, they need data scientists to help them replace traditional with modern.

# DATA SCIENCE TOOLS





# TOP ROLES IN DATA SCIENCE AND ANALYTICS

Ever since data took over the corporate world, data scientists have been in much demand. What further increases the attractiveness of this job is the shortage of skilled experts. Companies are willing to pour their revenue into the pockets of data science and analytics professionals who have the right skills to put an organization's data to work.

Here are a few types of roles one can target in this domain:

## The Data Scientist

A data scientist has the ability to handle the crude data using the latest technologies and techniques, can perform the necessary analysis, and can present the acquired knowledge to his associates in an informative way.

## The Data Analyst

Languages like R, Python and SQL are part of the data analysts' toolbox. Much like the data scientist role, a broad skill-set is also required for the data analyst role, which combines technical and analytical knowledge with ingenuity.

## The Data Architect

Data is (being collected) everywhere and as a consequence, more and more organizations are in need of

data architects. Industries like banking and FMCG use data architects to integrate, centralize, protect and maintain their data sources.

## The Business Analyst

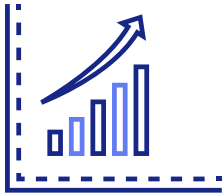
A business analyst performs the role of the middle person between the business folks and the techies. Organizations searching for business analysts are companies like Uber, Dell and Oracle.

## The Statistician

The title of statistician is regularly overlooked or replaced by fancier-sounding job titles. This is a bit of a pity, given that statisticians, with their solid foundations in statistical theories and methodologies, can be seen as the pioneers of the data science field.



# DEMAND FOR DATA SCIENCE AND ANALYTICS



Demand For Data Scientists Will Soar

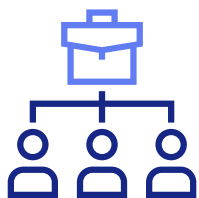
**28%**

By 2020

**59%**

of all Data Science and Analytics (DSA)  
job demand is in

**Finance and Insurance, Professional Services, and IT.**



Annual demand for data scientists, data developers,  
and data engineers will reach nearly

**700,000**

openings by 2020.

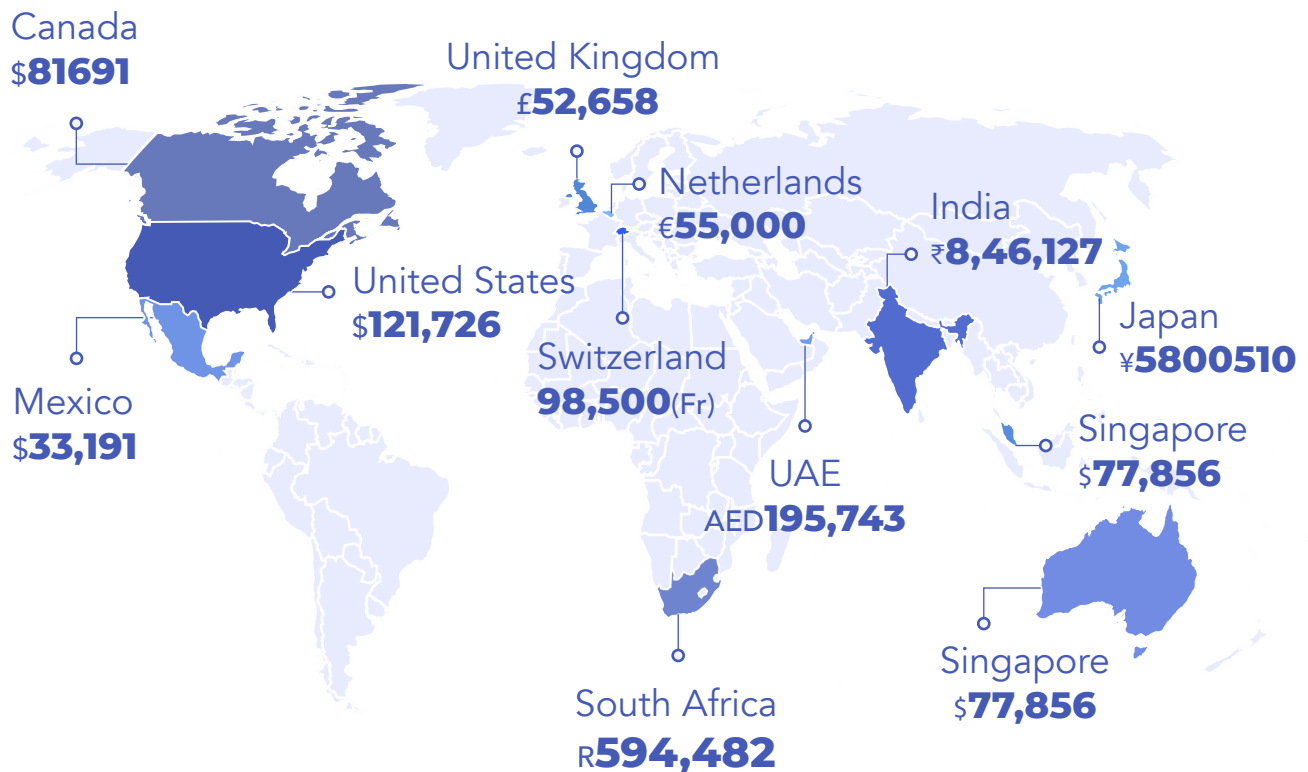
Data Science and Analytics (DSA) jobs remain open  
an average of

**45** days,

five days longer than the market average.



# AVERAGE SALARIES FOR DIFFERENT GEOGRAPHIES



Sources: Indeed; PayScale; Kaggle (2017); Data Science Salary Report 2019 Europe by Big Cloud)

## TOP INDUSTRIES FOR DATA SCIENCE AND ANALYTICS



Technology



Telecommunications



Manufacturing



Banking & Financial  
Services



Healthcare &  
Pharmaceuticals



Transportation  
& Automotives



Energy



Retail



Cyber Security

# TOP POSITIONS IN DATA SCIENCE AND ANALYTICS



Data Scientist



IT Systems Analyst



Operations Analyst



Healthcare Data Analyst



Data Engineer



Quantitative Analyst



Data Analytics Consultant



Digital Marketing Manager



Project Manager



Transportation Logistics Specialist

Source: [Dataquest.io](https://dataquest.io)

# ABOUT THE PROGRAM

The Post Graduate Program in Data Science and Business Analytics (PGP-DSBA) is a 7-month-long comprehensive program by The University of Texas at Austin and Great Learning.

Designed to enable career outcomes in Data Science and Analytics, it uniquely combines a

**comprehensive curriculum, covering the most widely-used tools and techniques in the industry, with a hands-on learning approach.**

A structured learning journey keeps you on track throughout as you achieve your weekly learning milestones with your mentor and benefit from their rich professional experience. Following a “learn by doing” pedagogy, the program offers you the opportunity to apply your skills and knowledge in real-time every week through



As you do so, you come to truly appreciate the nuances of data and build your portfolio in the process.

**All this comes with the credibility, global advantage, and academic leadership of McCombs School of Business at The University of Texas at Austin.**

**LEARN MORE AND APPLY**