



WHITE PAPER

Delivering on Data Science and AI for Competitive Edge



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EXECUTIVE SUMMARY

The data science function has changed radically in the past two decades. Today, data science professionals are in high demand for businesses in every industry sector, to better understand customers and purchasing patterns, drive performance and efficiencies, and to deliver consistent data throughout an enterprise that is on demand, verified, scalable and insightful. Data scientists possess the unique blend of technical ability and domain expertise required to clean, normalize, protect, analyze and deploy data systems. They also have the knowledge to successfully implement machine learning and other disruptive technologies, moving an organization closer to meaningful AI products and services.

This white paper explores the rise of data science roles, the need for organizations to innovate through machine learning, and effective methods to attract and develop top talent poised to take on these complex roles.

DATA-DRIVEN INSIGHTS ARE CRITICAL TO SUSTAINABILITY

Today and beyond, organizations are using data-driven insights to retain and ensure their competitive edge. Top CIOs are leveraging huge pools of data to improve operational efficiencies, safeguard the corporate security perimeter, streamline supply chain management, drive increased revenue and more.

Data science represents a vital ingredient in enabling companies to better understand their customers, build meaningful products, offer innovative services and optimize operations to improve ROI. The inability to use data as it currently exists makes finding the right talent to interpret it that more critical.

However, business and technology leaders are hard pressed to find, train or retrain the talent needed to perform the functions and roles required to generate these insights—data science roles. They're struggling to find viable contenders because today's hottest job also happens to have one of the scarcest supplies of qualified candidates.

Undeterred, top employers recognize the onus for attracting, retaining and advancing their data science employees is on them. These organizations are offering structured learning options to help develop the skills to advance employees from entry-level data analysts to data expert roles like data scientists.

THE RISE OF THE DATA SCIENTIST

This much is clear: the data scientist role is on the rise and experiencing high growth and demand. According to research by IDG, data analytics is the number one initiative CIOs are investing in, followed by cloud computing, enterprise applications and security.¹

The constant evolution of technologies means data is being generated like never before, and this data is streaming in from every facet of the organization through multiple systems and in different formats. Some of this data is critical, but much of it exists as “dark data,” data that is undefined, unstructured and unknown. Dark data is generated almost continuously as the byproduct of day-to-day office life. Consider these common sources of dark data:

¹ “CIOs Advance Their Strategic Role.” IDG, January 17, 2019.

- Spreadsheets
- Multiple versions of documents
- Email attachments and archives
- Former employee files
- Reports and survey data

This data is useless on its own. To reap actual value from it, this information must be removed from its silos and analyzed collectively, a near Sisyphean task without the right people with the right backgrounds, in the right roles. But these people are hard to find, harder to keep, and demand keeps growing—facts that give credence to Harvard Business Review’s 2012 prediction of data scientist as the “sexiest job of the 21st century.”

Data science roles require individuals with highly specialized skillsets that enable them to clean, analyze, interpret and apply data to inform business decisions. They must have sophisticated statistical ability, strong programmer skills and excel in communication and cross-functional work.

Because applying data to inform business decisions and measure outcomes is key in creating organizational strategy, managing operations and effectively governing the business, it’s unsurprising to learn demand for data scientist teams has grown: according to Indeed.com, the listings for data roles have grown by 256% since 2013.²

Formerly, data science teams were most needed in the tech and finance sectors—industries that have historically produced a lot of data—but today, the ability to make informed business decisions based on data is needed in every industry and in every function.

BIG DATA MATTERS—BUT NOT FOR THE REASONS ORGANIZATIONS THINK

Emerging technologies are on track to displace earlier technology, disrupt industries, and create new markets. Organizations are facing increased pressure to integrate these technologies into their business models in attempt to

² “The Top 5 Tech Skills for Data Scientists.” Joey Garza, *Indeed.com*, March 14 2019.

³ “The Age of Analytics: Competing in a Data-Driven World.” *McKinsey Global Institute, McKinsey*, December 2016.



By 2024, the U.S. is estimated to face a shortage of **250,000** data scientists.³

stay ahead of the curve, but without a narrow focus they risk worthless investments. It's imperative that businesses analyze what emerging technologies are most likely to transform their business in the next one, three, five and ten years and invest accordingly. For many, the priority is leveraging big data and AI. But to do so successfully, businesses need the proper data foundation and professionals to promote success.

Highly touted as the next cure-all for business woes, big data has been the hot buzzword for years now. Need to improve the consumer experience? Big data. Want to make internal functions and processes smarter? Big data. Interested in generating estimates or predictions at scale? Big data.

While all of this is possible using data, the mechanism by which insight is generated is more complicated: the actual power of data lives in its ability to build, develop and feed machine learning and deep learning algorithms and platforms.⁴ But before that's possible, the data must be cleaned and rendered usable by data professionals.

The companies investing in the people, processes and technologies to do so are reaping impressive benefits. Organizations using machine learning to predict what will likely happen next based on previous experiences are driving outcomes that best satisfy customers, gaining market share and growing revenues.

Today, not only is the sheer quantity of data produced driving the need for data science roles, so is the increasing application of machine learning in the workplace and our lives.

Consider:



75% of organizations using AI enhance their customer satisfaction by more than 10%.



34% of businesses using AI report an increase in lifetime customer value by one-third.



90% of companies using AI report speedier complaint resolution.⁵

⁴ "Machine Learning and AI: Changing How Data Science is Leveraged for Digital Transformation." Nick Ismail, *Information Age*, June 2017.

⁵ "Humans + Bots: Tension and Opportunity." *MIT Technology Review Insights and Genesys*, 2018.



“More recently, however, companies have widened their aperture, recognizing that success with AI and analytics requires not just data scientists but entire cross-functional, agile teams that include data engineers, data architects, and data-visualization experts”
Harvard Business Review

6 “CIO Trend Report 2019.” Info Tech Research Group.

7 “Reshaping Business with Artificial Intelligence.” Sam Ransbotham, David Kiron, Philipp Gerbert, and Martin Reeves, MIT Sloan Management Review, September 6, 2017.

8 “Reshaping Business with Artificial Intelligence.” Sam Ransbotham, David Kiron, Philipp Gerbert, and Martin Reeves, MIT Sloan Management Review, September 6, 2017.

DATA ROLES DIVERSIFIED

Data scientists aren't the only ones in demand these days. As the field has grown, data science team roles have become more defined. Big data and dark data initiatives have catalyzed differentiation, as specific skillsets for unique functions emerged. Data analysts, wranglers, scientists and engineers, among others, are needed to support the successful development and integration of these technologies within an organization.

Yet the data scientist remains the most coveted—and the scarcest. The need for technical ability complemented by top-tier leadership and communication skills is most pronounced in this role. Data scientists must be able to translate ideas, collaborate with others, lead teams and communicate with senior leadership. They must also be well-versed in their industries; strong functional domain knowledge is key to translating organizational goals into data-driven deliverables like prediction engines, optimization algorithms and pattern recognition. In light of all this, it's unsurprising the U.S. is estimated to face a shortage of 250,000 data scientists by 2024.¹⁰

ATTRACT AND RETAIN MORE DATA SCIENCE ROLES WITH THE RIGHT EVP

With a scarce talent landscape for data roles, leading organizations are reconsidering employees as internal clients rather than skill, knowledge or service providers. To attract and retain these highly sought-after candidates, employers are formulating and maintaining compelling employee value propositions (EVP). Used as a recruitment and retainment tool, EVPs communicate the unique combination of benefits, rewards, services and advancement opportunities an organization offers to employees in exchange for their work and skills.¹²

The most enticing EVPs make learning and development a core focus of their offerings. Today more than ever before, the modern workforce favors opportunities for learning and development when considering employers or deciding to remain with their current organization. Deloitte found that 47% of Gen Xers and millennials rate promotion or job advancement one of the top three most effective retention strategies, while 29% of Gen Xers and 31% of millennials



65% of CIOs surveyed “report a lack of talent holding their organization back” and say they are unable to keep pace with changes in technology.⁹

“Many organizations don’t recognize the mix of talent and skills required to be successful when applying data science. Some put great faith in data scientists but fail to reckon with the importance of business and functional expertise to the success of a project.”

Deloitte¹¹

⁹ “CIO Survey 2018.” Harvey Nash, KPMG, 2018.

¹⁰ “The Age of Analytics: Competing in a Data-Driven World.” McKinsey Global Institute, McKinsey, December 2016.

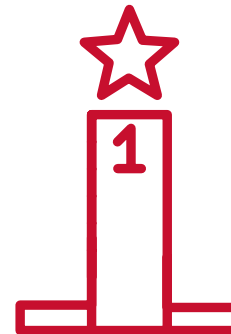
¹¹ “Democratizing Data Science to Bridge the Talent Gap.” David Schatsky, Rameeta Chauhan, Craig Muraskin, Deloitte, December 13, 2018.

¹² “Strengthen Your EVP.” Brian Kropp, Gartner, 2019.

said the same for development opportunities.¹³ It's clear that offering considerable advancement and development opportunities is a significant part of any compelling EVP.

When it comes to formulating definitive and articulate EVPs at your organization, “focus on the 5% that delivers 95% of the value.” Top performers disproportionately contribute to the success of an organization: they are up to 8x as productive and productivity increases alongside a rise in complexity of job role.¹⁴

Work first to tailor EVPs for data science roles. These individuals are challenging to source and difficult to keep in the door—according to Indeed.com, the typical tenure for data scientists is less than one year.¹⁵ Narrow the scope of focus of EVPs for these roles to drive the most value and reap the highest return.



OFFER CAREER PATHS, NOT JUST JOBS

Employees expect to see employers playing an active role in their career path by offering opportunities for development. By upskilling, preskilling or reskilling current talent, organizations retain invaluable institutional knowledge and develop the unique skills needed in-house. To have a healthy high-performing workforce, businesses must share the burden of training and development with employees and subsequently reward their efforts by offering a way forward with the company.

“The bargaining power in data science remains with the job seekers.”

Indeed.com

“Upskilling: Learning new skills to enact accountabilities with a current role.

Preskilling: Learning new skills to enact accountabilities associated with a higher-level role in the same job family.

Reskilling: Learning new skills to enact accountabilities associated with a new role in a different job family.”¹⁶

Joselito Lualhati, PhD

¹³ “Talent 2020: Surveying the Talent Paradox from the Employee Perspective.” Alice Kwan, Bill Pester, Neil Neveras, Robin Erickson, Jeff Schwartz and Sarah Szpaichler, Deloitte.

¹⁴ “Attracting and Retaining the Right Talent.” Scott Keller and Mary Meaney, McKinsey, November 2017.

¹⁵ “Data Scientist Salaries in the United States.” Indeed.com, March 30, 2019.

¹⁶ “Optimizing Upskilling, Preskilling & Reskilling Programs, Assessment Matter.” Joselito Lualhati, PhD, GSX Corporation, April 2019.

CONSIDER THE CASE OF A DATA ANALYST AT A FORTUNE 500 COMPANY.

“There are new data scientist roles at my organization, and I want the job!”

- Joins a multinational pharmaceutical company eighteen months ago as a data analyst.
- Demonstrates talent and skills for analytics in deriving insights from data.
- Excited by the prospect of using data as a decision tool and leveraging insights to help advise the business.
- Eager to advance her skills and elevate her position.
- Wants to work at her own pace and needs flexible learning options to fit her schedule.
- Emphasizes the need for hands-on learning that enables practice and is challenging.
- Desires an approach that offers a practical sandbox environment to accomplish more than theory.

Skillsoft’s Data Analyst to Data Scientist Aspire learning journey is a sequenced path of instruction and credentials that helps individuals build the skillset necessary to prepare for an aspirational role. To do so, Skillsoft identified the top career paths that tech workers are interested in for staying current and preparing for the future. Our learning journeys offer more than 90 hours of courses and multimodal content to prepare the learner.

The Skillsoft Aspire Data Analyst to Data Scientist journey takes a learner on a path that starts with courses covering areas that data analysts typically are involved with on a day-to-day basis.

- Topics such as Python, R, architecture and statistics help them progress to the next role are then introduced.
- By the end of the 90+ hour journey, the learner will have worked up to visualization, APIs, machine learning and deep learning algorithms.
- Assessments are available so each learner can demonstrate their knowledge and applicability of the material covered.
- Users must pass a rigorous final exam and complete a capstone project to earn their credential.



BALANCING MISSION-CRITICAL WITH INNOVATION

Technology leaders face a host of challenges today. Many are trying to balance the operations needed to keep the lights on with the integration of disruptive technologies to drive innovation. Often this balancing act is taking place against the backdrop of legacy systems and processes which require regular upkeep and ongoing issue mitigation. The immediacy of these mission critical needs makes it difficult carve out the time needed to grow a data science team and develop AI applications for specific business use cases.

Meanwhile, the constant evolution of new and emerging technologies has rendered the supply of data professionals incapable of meeting demand—and yet these individuals are increasingly viewed as vital to retaining a competitive edge. Without data professionals, organizations are left trying to make sense of siloed, disparate data with little chance of success. Leading technology professionals know integrating machine learning is increasingly necessary for meaningful innovation of goods and services, but nearly impossible without the highly technical know-how of data professionals.

Top tech leaders recognize the opportunity to advance current employees with targeted learning paths is critical to developing the talent that's needed in-house. Skillsoft's Data Scientist Aspire journey is the key for fitting the learning time needed for personal and organizational growth into the cracks of the calendar. Skillsoft's Aspire Data Analyst to Data Scientist Journey takes the learner through an upskilling, preskilling and reskilling journey to ensure employees have the skills and behaviors necessary for success today and tomorrow. [Visit our website](#) to learn more.

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Mike Hendrickson is Vice President, Technology & Developer Products at Skillsoft. Prior to Skillsoft, Mike spent 15 years at O'Reilly Media, Inc. where he most recently was the VP of Content Strategy.

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ABOUT SKILLSOFT

Skillsoft is a front-runner in corporate learning, delivering beautiful technology and engaging content that drives business impact for modern enterprises. Skillsoft comprises three award-winning systems that support learning, performance and success: Skillsoft learning content, the Percipio intelligent learning experience platform and the SumTotal suite for Human Capital Management.

Skillsoft provides a comprehensive selection of cloud-based corporate learning content, including courses, videos, books and other resources on Business and Management Skills, Leadership Development, Digital Transformation, Technology and Developer, Productivity and Collaboration Tools and Compliance. Percipio's intuitive design engages modern learners and its consumer-led experience assists in accelerating learning. The SumTotal suite features four key components built on a unified platform: Learning Management, Talent Management, Talent Acquisition and Workforce Management.

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