

# Data Science Platforms Help Companies Turn Data Into Business Value

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**Contributing Research:** Forrester's Enterprise Architecture research group

## Executive Summary

In the wake of digital innovation, a new kind of company has emerged: the insights-driven business. These businesses build closed-loop systems for using data, data science, and software to create competitive advantage and differentiation. Forrester predicts that these firms will earn \$1.2 trillion in revenue in 2020.<sup>1</sup> Enterprises with aspirations to combat or become like these insights-driven disruptors need to change how they operate and how they invest in technology.

In September 2016, DataScience commissioned Forrester Consulting to examine the differences between high-growth firms using insights-driven practices such as data science, and everybody else. Specifically, they wanted to find out if a platform that unifies the entire life cycle of data science work could accelerate a firm's competitive advantage through insights.

**A data science platform contains tools for the entire life cycle of data science work: data integration and exploration, model development, and model deployment.**

Forrester conducted 10 in-depth interviews and an online survey of 208 decision-makers in business/customer insights, data science, and data engineering roles. Through this research, we identified a minority of firms (22%) that were "Insights Leaders" (see Figure 1). Our study found that Insights Leaders are two times more likely to be in a market-leading position in their industries than "Insights Laggards" firms or "The Pack," the other two groups we studied. Leaders also have significantly higher revenue growth and profits that exceed company and shareholder expectations.

### KEY FINDINGS

Forrester's study yielded five key findings:

- › **Insights Leaders use data science for competitive advantage.** Insights Leaders have budgets for advanced analytics capabilities such as data science that are twice the size of Insights Laggards' budgets (\$2.2 million versus \$1.1 million, on average). They are also four times more likely than Laggards to drive growth that exceeds shareholder expectations. Insights Leaders use their bigger budgets to improve their data science capabilities. For example, 62% of Insights Leaders have a data science development plan and road map in place, compared with only 28% of Laggards and 29% of The Pack.
- › **Insights Leaders tend to be small, agile disruptors.** Our survey confirmed smaller companies are most likely to be Insights Leaders and have advanced data science practices. This is a call to more established enterprises: Learn how to be insights-driven or be disrupted.
- › **Most firms miss the keys to good data science because they focus on the data.** Virtually all respondents (99%) consider data science an important discipline for their firm to develop, and 74% consider it among the most important initiatives they are undertaking to meet increasing demand for insights. However, our study found that most firms focus on data collection over data science, and many continue to prioritize data sources over technologies like APIs that can help turn data into action.
- › **Tool sprawl and integration are top technology challenges.** On average, respondents currently use more than half of the analytics tools we asked about (6.7 of 12) — from basic business intelligence (BI) tools and relational databases to predictive analytics, streaming analytics, and NoSQL databases. Many also plan to implement new analytics tools in the next year. This is problematic without an integrated approach. Nearly half of respondents (46%) lacked an integrated, fully functional platform for their data science technology stack. As a result, the top reported technology challenge is having too many tools that don't integrate well with each other.
- › **Platforms lead to better data science results.** Our survey revealed that Insights Leaders leverage a platform approach to their data science technology stack; in fact, 88% of Leaders reported using a fully functional platform, either with vendor solution(s) or a combination of open source and custom coding. Platforms help Leaders by unifying technology and infrastructure and providing a foundation for iterating rapidly on solutions. Platforms also help institutionalize knowledge and promote collaboration, which is critical in a market with widespread talent scarcity and retention concerns. Adoption of a *single* platform for managing the life cycle of data science work is likely to rise from 26% to 69% over the next two years as firms start to realize the potential benefits.

## Data Science Helps Insights Leaders Perform Better

Forrester predicts that a new class of businesses will grow from \$333 billion in 2015 to \$1.2 trillion in 2020 — growth more than eight times that of global GDP — disrupting established market leaders in their wake.<sup>2</sup> We call these insights-driven businesses, and they embed analytics and software into their operating models to bring insights — actionable knowledge resulting from analytical models and algorithms — into every decision. As a result, these firms drive competitive advantage and growth that together are putting their competitors out of business.

In order to understand how these firms do what they do, we conducted 10 in-depth interviews and an online survey of 208 decision-makers in business/customer insights, data science, and data engineering roles. We segmented survey respondents into three groups — Insights Leaders, The Pack, and Insights Laggards — based on an insights maturity framework (see Figure 1).<sup>3</sup>

Our study revealed Insights Leaders have an edge over other segments:

- › **Insights Leaders are doing better as a business.** We found that our Leader group was much more likely to have revenue growth exceeding 5%, more likely to be in a market-leading position in their industry, and more likely to be exceeding shareholder expectations for growth and profit. (see Figure 2).
- › **Smaller firms have an insights edge.** Our study found that Insights Leaders are more likely to be on the smaller end of the companies we surveyed, with 53% of them falling into the 1,000- to 4,999-employee range. Furthermore, Insights Laggards have a much higher percentage of large companies (see Figure 3).
- › **Insights Leaders invest in advanced analytics.** Insights Leaders have budgets for advanced analytics capabilities such as data science that are twice the size of budgets for Insights Laggards (\$2.2 million versus \$1.1 million on average) and about 1.5 times that of The Pack.<sup>4</sup>

FIGURE 1

### We Used A Maturity Framework To Identify Insights Leaders, Insights Laggards, And The Pack

#### Insights maturity framework

- A series of 12 statements represented key steps toward becoming an insights-driven business.
- Statements focused on data sources, analytics capabilities and processes, insights strategies, and turning data into action.
- Respondents agreed or disagreed with each statement on a five-point scale.
- Forrester tallied the total scores and defined each segment based on the score distribution across all respondents.

#### Segment breakdown



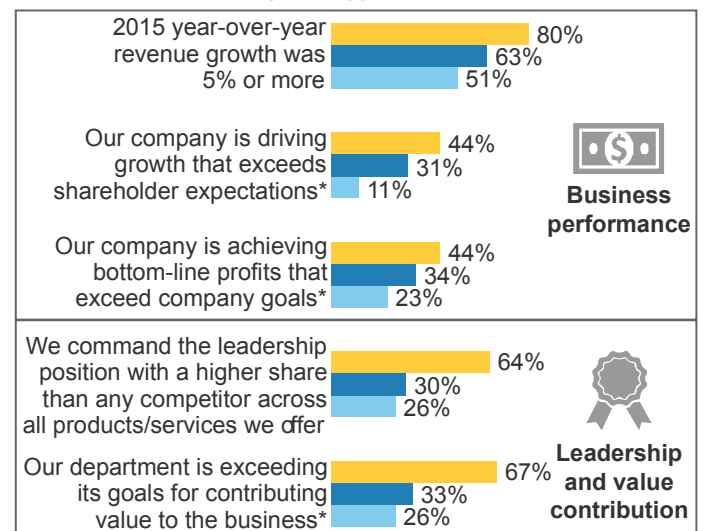
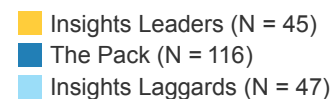
Base: 208 insights decision-makers in business, data science, and engineering roles at US enterprises

(percentages may not total 100 because of rounding)

Source: A commissioned study conducted by Forrester Consulting on behalf of DataScience, October 2016

FIGURE 2

### Insights Leaders Outperform Other Firms On Key Business Metrics



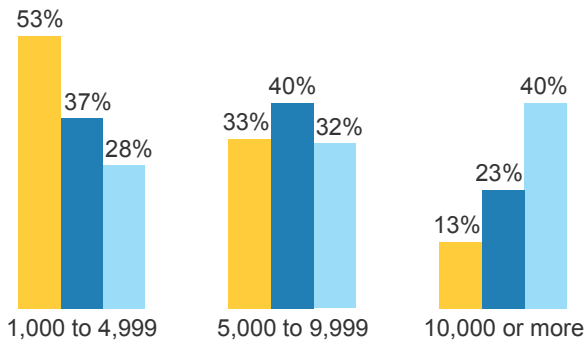
Base: variable insights decision-makers in business, data science, and engineering roles at US enterprises

Source: A commissioned study conducted by Forrester Consulting on behalf of DataScience, October 2016

**FIGURE 3**  
Smaller Firms Tend To Be Insights Leaders

Company size (employees) per segment

- Insights Leaders (N = 45)
- The Pack (N = 116)
- Insights Laggards (N = 47)



Base: variable insights decision-makers in business, data science, and engineering roles at US enterprises

(percentages may not total 100 because of rounding)

Source: A commissioned study conducted by Forrester Consulting on behalf of DataScience, October 2016

› **Insights Leaders use data science to turn data into action.** In our survey, 99% of respondents indicated that data science is an important discipline for their firm to develop, and 74% believe data science is among the most important disciplines supporting the rising demand for insights. Insights Leaders already have an edge here as well — most have a data science road map and have identified use cases for big data across the organization, compared with less than 30% of other firms (see Figure 4).

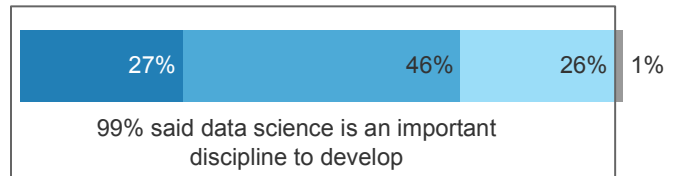
*“[With] predictive models . . . we can determine what the risks would be while doing a campaign, how much marketing will be required. It helps us with the budgeting of the campaign and in turn helps us with the training of employees.”*

—Vice president, multinational banking corporation

**FIGURE 4**  
Data Science Accelerates Insights, And Insights Leaders Have Made Data Science A Priority

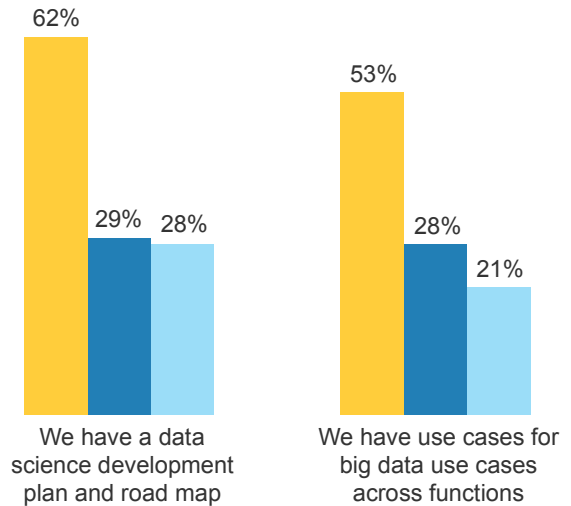
“As demand for analytic insights increases, what role do you believe data science will play in helping your organization generate the insights it needs?”

- Data science is the most important discipline we are developing to meet the organization’s demand for insights
- Data science is one of a few key disciplines/initiatives supporting my organization’s increasing demand for insights
- Data science is important in its own right, but not closely tied to our increasing need for insights
- We do not see data science as an important discipline for our firm to develop



“Which of these data science/analytics approaches does your organization apply today?”

- Insights Leaders (N = 45)
- The Pack (N = 116)
- Insights Laggards (N = 47)



Base: variable insights decision-makers in business, data science, and engineering roles at US enterprises

Source: A commissioned study conducted by Forrester Consulting on behalf of DataScience, October 2016

## The Problem: Too Much Data, Too Many Tools, Not Enough Action

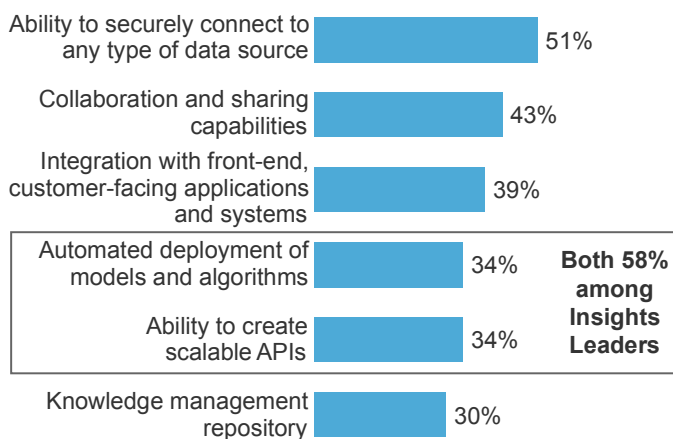
The market for data and analytics tools is exploding, and despite high aspirations, most companies fall short of being insights driven. In the scramble to catch up, many have adopted a hodgepodge of tools without a clear strategy for how each fits in the broader analytics technology stack. Meanwhile, high demand for data scientists, analysts, and engineers has created a talent shortage. These dynamics affect organizations at all maturity levels; for example, even Insights Leaders struggle with issues like talent and keeping insight models relevant. Specifically, our study showed that:

- › **Most firms focus on data, not action.** When asked to identify important features for a data science technology solution, respondents favored data sources over capabilities that create action from insight. For example, automated deployment of models and the ability to create APIs — both of which help firms operationalize insights at scale — have taken a back seat (see Figure 5). On the other hand, we found Insights Leaders far more likely to consider these insight execution capabilities as critical.

**FIGURE 5**  
Top Desired Technology Features Reflect A Data-Centric Approach That May Not Lead To Action

**“In thinking of your organization’s ideal technology solution for managing the entire life cycle of data science work, how important are the following features, functions, and capabilities?”**

(Percent selecting “critical”)



Base: 208 insights decision-makers in business, data science, and engineering roles at US enterprises

(not all responses shown)

Source: A commissioned study conducted by Forrester Consulting on behalf of DataScience, October 2016

- › **Continuously optimizing action is a big gap for all.** Only 11% of all respondents (and just 13% of Leaders) reported that they have an ability to monitor and iterate on production models. Forrester sees this as essential for continually executing relevant insights in real time.

**Only 11% of firms reported that they monitor and iterate on live models. As a result, the remaining 89% have limited ability for real-time insight to execution.**

“I like to use the umbrella term, ‘actionable intelligence.’ . . . Everything comes down to whether the data is actionable or not.”

— Director, information security and IT risk management, global manufacturing and engineering company

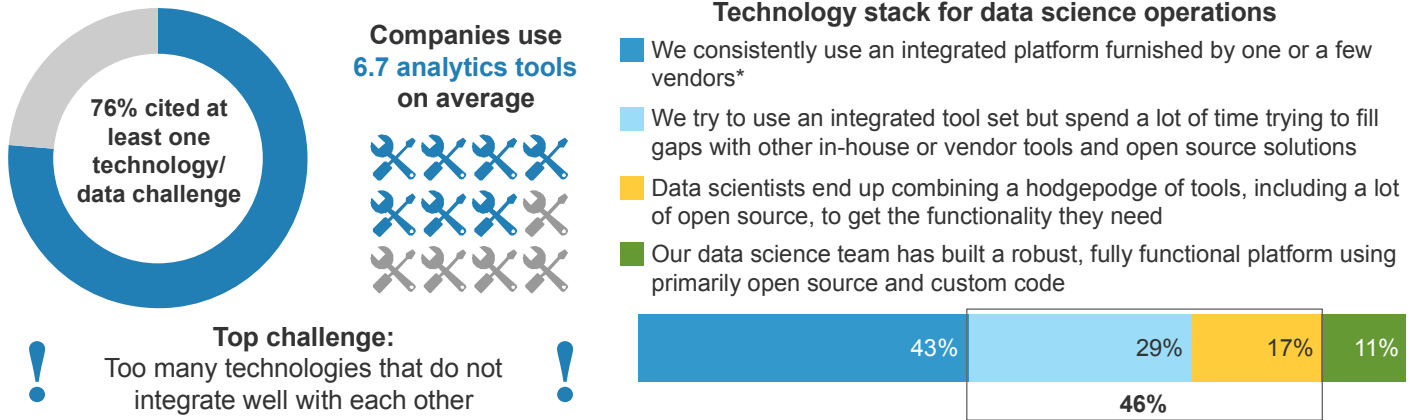
- › **Rapid uptake of disconnected tools impedes progress.** Respondents reported using more than half of the analytics tools we asked about (6.7 of 12 on average) — from basic BI tools and relational databases to predictive analytics, streaming analytics, and NoSQL databases. Many also have plans to implement even more tools in the next year. However, 46% lack an integrated platform for using these tools harmoniously. The top technology and data challenges we found reflect this lack of an integrated approach (see Figure 6).

“A lot of our current systems are set up on batch feeds, so having a real-time information flow is not feasible. For example, if a customer browses for kayaks and then logs out and returns the same day, then we have no means to identify their last interaction . . . not able to channel appropriate information to the customer on the same day.”

— Digital marketing director, US retail company

**Top challenge: Too many analytics technologies that do not integrate well with each other**

**FIGURE 6**  
**Firms Struggle With The Repercussions Of Adopting New Analytics Tools Without An Integrated Approach**



\*These respondents may or may not use a data science platform that handles the entire life cycle of data science work. See Figure 8.

Base: 208 insights decision-makers in business, data science, and engineering roles at US enterprises

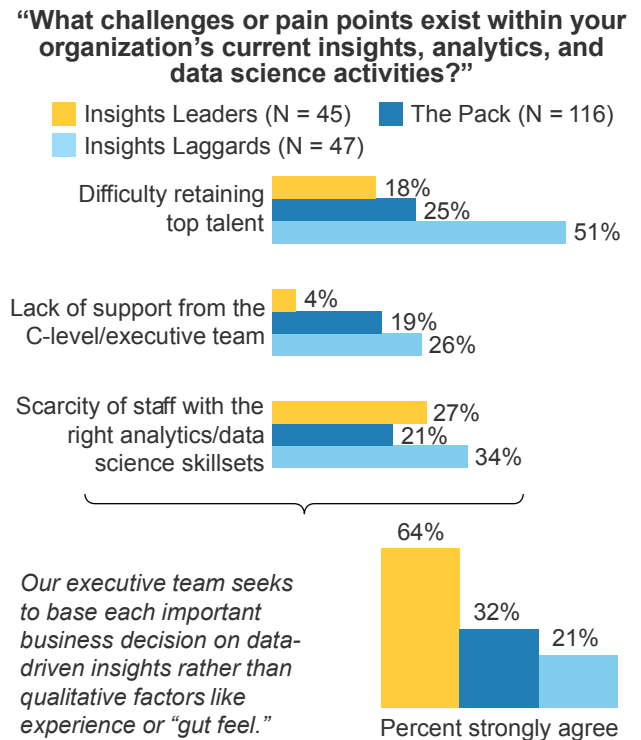
Source: A commissioned study conducted by Forrester Consulting on behalf of DataScience, October 2016

› **Talent is more of an issue when executive support is lacking.** While talent scarcity remains an issue for every firm we surveyed, Insights Leaders have fewer concerns about retention, likely due to strong executive support for insights. Only 4% of Leaders reported lack of executive support as a challenge, while 64% strongly agreed that their exec team takes an insights-driven approach to decision making (see Figure 7).

*“No matter what you are trying to prove [with analytics], your management needs to understand . . . what does it mean to our business?”*  
 — Director, security and IT risk management, global manufacturing and engineering company

**Only 4% of firms that are Insights Leaders consider lack of executive support to be a challenge.**

**FIGURE 7**  
**Leader Firms Adopt An Insights-Driven Mentality From The Top Down, Leading To Fewer Challenges**



Base: variable insights decision-makers in business, data science, and engineering roles at US enterprises

Source: A commissioned study conducted by Forrester Consulting on behalf of DataScience, October 2016

## Data Science Platforms Accelerate Insights Maturity

Our study found another revealing difference between Insights Leaders and the other groups: use of platforms for data science. Data science platforms are integrated tool sets for all the steps in a data science workflow, including data integration and exploration, model development, and model deployment. Our study found that:

### › Data science platforms are an emerging focus.

Insights Leaders have invested in a platform approach to data science — 88% of Insights Leaders reported a platform approach to their data science technology stack. Forrester sees this as natural — high-performance Insights Leaders use data science platforms to overcome tools sprawl and focus the effort of their teams on insights and action.

Our study also found that:

› **Firms see value in adopting a single data science platform.** Additionally, we asked respondents about their plans for adopting a *single* platform to manage the entire life cycle of data science work, and while few (26%) use a single data science platform today, adoption is likely to rise to 69% in the next two years. Not surprisingly, Insights Leaders are ahead of the adoption curve, while Laggards are way behind (see Figure 8).

› **Both businesses and their customers are benefiting from data science platforms.** More than a third of respondents envision improving customer experiences, making better business decisions, and realizing cost efficiencies with a single platform to manage the life cycle of data science work (see Figure 9).<sup>5</sup> Interview participants also saw many potential benefits, though some were pragmatic as to whether their organization has enough data science maturity to capture the full value.

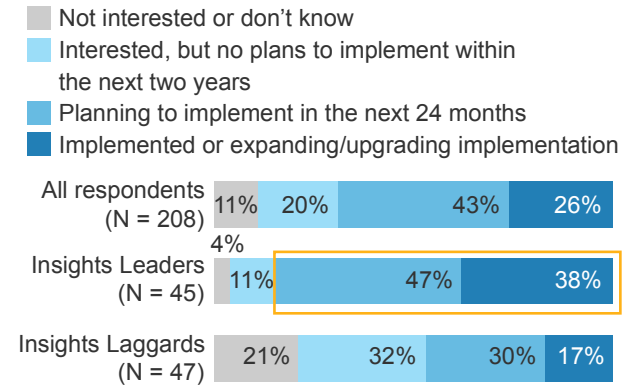
*“I think the single-platform approach will be fantastic, as everyone would be reading from the same book versus the abridged or unabridged version.”*

— Senior digital product and marketing director, leading US grocery retailer

FIGURE 8

Data Science Platforms Are An Emerging Focus, Particularly for Insights Leaders

“What are your organization’s plans to adopt a single platform that manages the entire life cycle of data science work?”



Implemented or planning to implement within two years: Leaders = 85%, Laggards = 47%, Overall = 69%

Base: variable insights decision-makers in business, data science, and engineering roles at US enterprises

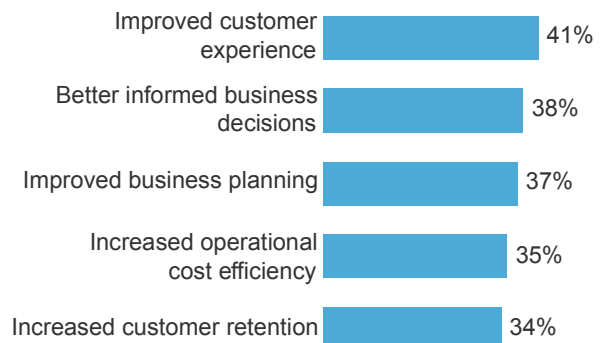
Source: A commissioned study conducted by Forrester Consulting on behalf of DataScience, October 2016

FIGURE 9

Data Science Platforms Have Many Benefits

“Which of the following benefits have you realized or do you expect from a single platform that manages the entire life cycle of data science work?”

(Select all that apply)



Base: 208 insights decision-makers in business, data science, and engineering roles at US enterprises

Source: A commissioned study conducted by Forrester Consulting on behalf of DataScience, October 2016



"[A single platform] could be of great value to us. The trick is to have an organization prepared to leverage it. . . . We need to make sure that we have the right team."

— *Chief marketing officer, leading retail and repair corporation*

- › **Respondents often view data science platforms as they do business intelligence software.** Unlike other analytics software packages, insights platforms offer technologies to help operationalize insight, ways to automate analytics work, a consolidated big data foundation, and tools to help teams experiment and continually optimize.<sup>6</sup> However, survey respondents have a narrower view of how to leverage data science platforms, envisioning IT and executive management as the primary users. This approach aligns more with basic BI tools than transformative insight platforms, which could hinder a firm's ability to use data science for competitive advantage.

"Data science results should not just be limited to certain departments but be shared across the organization."

— *Director, product development and engineering, global telecommunications company*

## Key Recommendations

The ability to effectively turn data into action is increasingly becoming a competitive differentiator. To succeed in this insights-driven landscape, organizations should consider the following recommendations:

- › **Unify data science technology into a single, unified platform.** Insights Leaders recognize their competitive advantage often comes from the speed at which they can quickly optimize insight applications. Platforms unify the tools data scientists need to develop and deploy these. Thinking about your data science tools as a connected platform and taking steps toward integrating and unifying them is a strong step in the right direction for any firm. Vendors recognize this need, and there are many that offer better integrated tool chains. For example, improve integration between data science notebooks, predictive analytics coding languages, and machine learning libraries.
- › **Make data science transparent and part of the business decision making.** Many data scientists we work with report a common frustration — businesses hire them with the expectation of magic, and then isolate them in organizational silos expecting the magic to just happen. But data scientists are not magicians; they are professionals with an esoteric skill. Firms must integrate data science activities into the larger processes of strategic business decision making. Hand in hand with this, take steps to create transparent data science input, discovery, and output processes. This will give your business executives more comfort with the results of data science efforts, and it will bolster the prestige of your data scientists, which is important for talent retention.
- › **Improve collaboration and knowledge management to mitigate turnover.** Regardless of the technology, data, and top-down support, expect high staff turnover in your data science teams. Combat this by putting in place collaboration tools and processes that institutionalize knowledge, including the data sources and provenance for analytic models, the computations performed on derived data and insight, the process and application insights derived from data science, and the implementation and governance of analytic models. Implementing capabilities to manage this knowledge will accelerate onboarding of new talent and ensure team operations are not disrupted as talent comes and goes.
- › **Treat data science platforms as a strategic, transformative investment.** Buyers are sometimes confused by insight platforms (of which data science platforms are a segment) because they can appear similar to other analytics packages or big data management platforms. Don't make this mistake, or you'll miss the opportunity to transform your business with data science. To leverage a data science platform like an insights-driven business, capabilities need to be made broadly available to teams like R&D, product, and marketing that can use data science to optimize products and customer interactions — in addition to typical users like IT and executive management.

## Appendix A: Methodology

In this study, Forrester conducted an online survey of 208 respondents in the US and interviewed 10 additional organizations to evaluate how organizations are advancing their use of data for insights and action. Industries in the scope of the research included manufacturing, retail, financial services, technology, government, telecom, media, entertainment, internet services, and energy. Participants included manager-level and above decision-makers and influencers in customer/business insights, data science, and data engineering roles. Questions provided to the participants asked about their organizations' aspirations, approaches, and challenges with data and analytics, and how technology solutions fit in. Respondents were offered a small incentive as a thank you for time spent on the survey, and interviewees were provided a larger incentive for their time to participate in the interview. The study began in September and was completed in October.

## Appendix B: Supplemental Material

### RELATED FORRESTER RESEARCH

"Digital Insights Are The New Currency Of Business," Forrester Research, Inc., April 27, 2015

"The Insights-Driven Business," Forrester Research, Inc., July 27, 2016

"Insight Platforms Accelerate Digital Transformation," Forrester Research, Inc., April 27, 2016

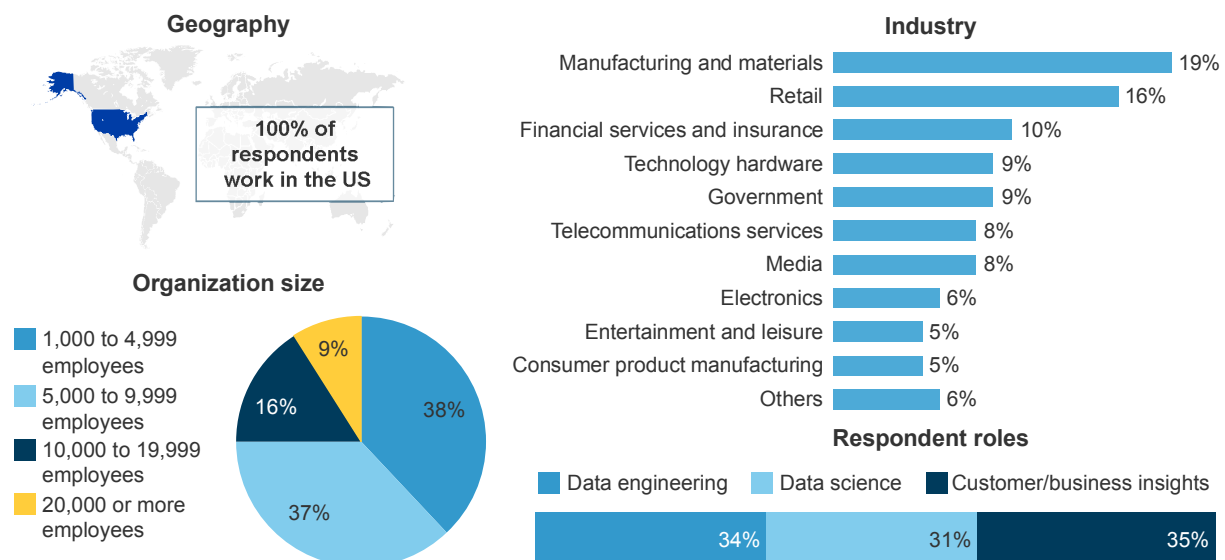
"Brief: Why Data-Driven Aspirations Fail," Forrester Research, Inc., October 7, 2015

"Vendor Landscape: Insights Platforms, Q3 2016," Forrester Research, Inc., August 2, 2016

"A Stopgap For Data Science Scarcity," Forrester Research, Inc., September 21, 2015

## Appendix C: Demographics/Data

**FIGURE 10**  
Respondent And Company Details



Base: 208 insights decision-makers in business, data science, and engineering roles at US enterprises  
(percentages may not total 100 because of rounding)

Source: A commissioned study conducted by Forrester Consulting on behalf of DataScience, October 2016

## Appendix D: Endnotes

<sup>1</sup> Source: “The Insights-Driven Business,” Forrester Research, Inc., July 27, 2016.

<sup>2</sup> Source: “The Insights-Driven Business,” Forrester Research, Inc., July 27, 2016.

<sup>3</sup> Our analysis of insights-driven maturity was derived from a series of 12 statements that represent key steps toward becoming an insights-driven business. For example, statements included: “We are good at advanced analytics and data science” and “We are good at sharing data across organizational boundaries.” Respondents agreed or disagreed with each statement along a five-point scale, where 5 meant “strongly agree,” and we tallied the total scores and reviewed the distribution of respondents. We defined each segment score range based on: 1) a natural break in the distribution of respondents for a given range and 2) a requirement to have at least N = 40 respondents in each of the three segments we defined. Insights Leaders agreed or strongly agreed with nearly all statements, indicating that they have embedded data science into their operations and customer interactions. Insights Laggards are at the other end of the spectrum, having mastered few, if any, insights-driven disciplines. The remaining majority, “The Pack,” has made headway in certain areas but has not yet achieved mastery across the board.

<sup>4</sup> In our survey, respondents indicated a range for their total annual data and analytics budget, including all analytics technology solutions/tools, headcount, third-party services, etc. Later, they indicated the percent of their total data and analytics budget that is used for data science and predictive analytics. To calculate total spend on data science and predictive analytics, we took the midpoint of each budget range and multiplied it by the percentage indicated in the later question, then weighted the data based on company size (to account for a greater proportion of smaller companies in the Leaders segment and larger companies in the Laggards segment), and calculated the weighted average.

<sup>5</sup> Our survey defined data science platforms as single platforms that manage the entire life cycle of data science work. We also provided the following clarification to respondents: As an example, all of the following activities would fall into the “life cycle of data science work”: connecting data sources, ensuring governance, data exploration and analysis (including visualization), data transformation and enrichment, model development and iteration/collaboration, model deployment, and model monitoring/adjustment.