Data Science Needs to Grow Up: The 2021 Domino Data Lab Maturity Index

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Executive Summary

The world's most sophisticated companies overwhelmingly count on data science as a key driver for their long-term success. But according to a new survey of 300 data executives at companies with more than $1 billion in annual revenue, flawed investments in people, processes, and tools are causing failure to scale data science. These obstacles are evidence that operationalizing data science is hard, and progress requires a level-headed assessment of an organization's "data science maturity" and associated resource needs for achieving the successful creation, deployment, and maintenance of production models at scale.

The survey revealed five conclusions as to why data science initiatives fail:

1. Short-term Investment thwarts growth expectations
2. The role of data science is unclear
3. More revenue requires better models
4. Unimproved models bring higher risk
5. Must clear key obstacles to achieve goals

In addition to the survey results, this report debuts the Domino Data Lab Maturity Index: an independent assessment of organizational data science health. The Maturity Index was administered to each survey respondent. It measured organizations' ability to use the right tools, hire the right number of productive data scientists, get models into production at scale, and coordinate the complex efforts of large teams across the enterprise. The results of the survey were compared to the Maturity Index assessment from Domino and the results were striking, showing a strong correlation between increased revenue and Maturity Index performance. Leaders seeking to capture the expected return on their data science investments can use the Domino Data Science Maturity Index as a tool for achieving better models and financial results.

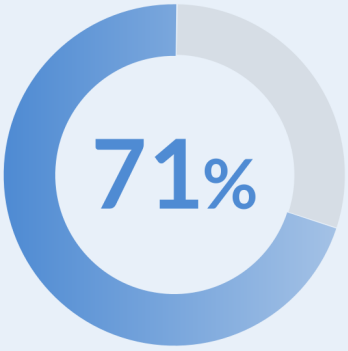
Methodology

The Domino Data Lab Survey was conducted by Wakefield Research (www.wakefieldresearch.com) among 300 U.S. executives in data science roles and with a minimum seniority of senior director, at companies with a minimum annual revenue of $1B+ USD and which have invested in data science initiatives. The survey of 20 questions was conducted between 16-28 June 2021 using an email invitation and an online survey. Results of any sample are subject to sampling variation. The magnitude of the variation is measurable and is affected by the

number of interviews and the level of the percentages expressing the results. For the interviews conducted in this study, the chances are 95 in 100 that a survey result does not vary, plus or minus, by more than 5.7 percentage points from the result that would be obtained if interviews had been conducted with all persons in the universe represented by the sample.

Key Finding 1: Short-Term Investment Thwarts Growth Expectations

Corporations are always focused on the bottom line, which is why 71% of data executives say their company leadership expects revenue growth from their investment in data science. A quarter of data executives (25%) say their company leadership expects double-digit growth from data science. But among data executives who expect more revenue from their investment in data science, a shocking 48% say their company has not invested enough to meet those expectations. For data science to have the transformative impact leaders expect, they need to treat it like the first-class discipline it is.



of data execs say their company leadership expects revenue growth from their investment in data science.

Asked Among 300 U.S. executives in data science roles

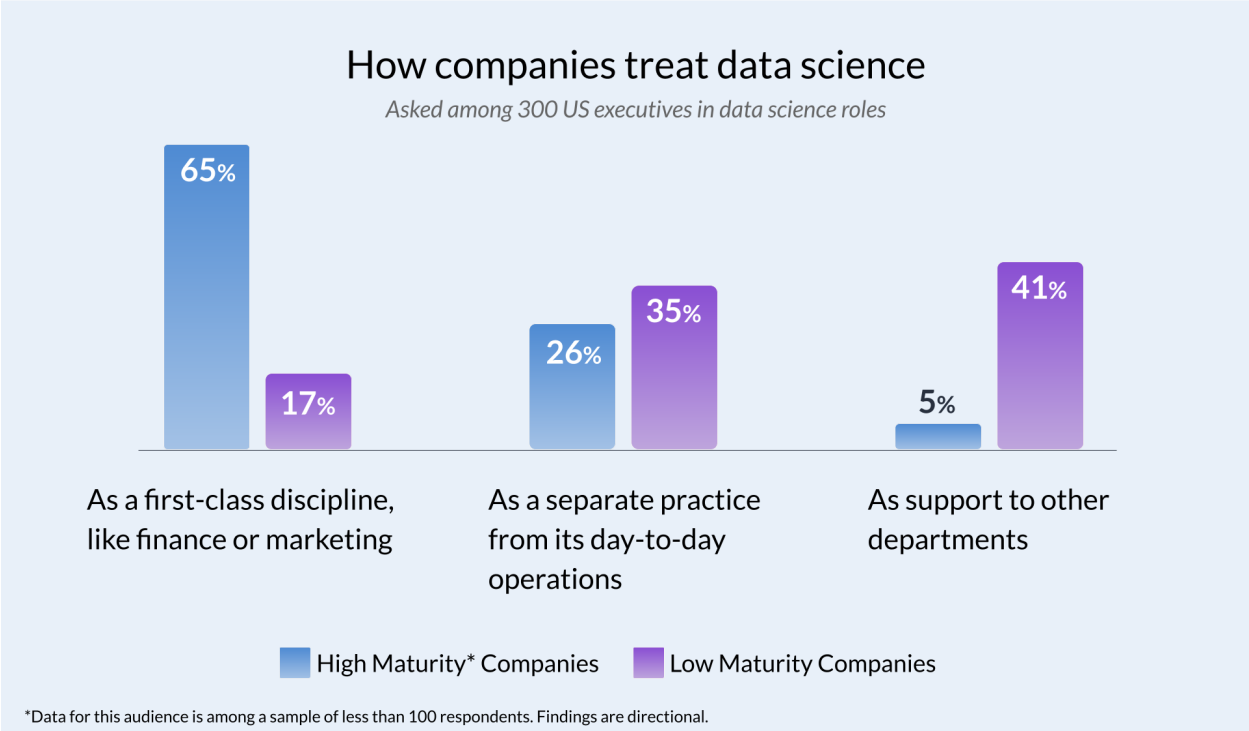
But among those whose leadership expect growth, **48%** say their company hasn't invested enough in data science to meet those expectations.

Shortsighted. While company leadership might have big expectations for data science in the long term, they are too often making short-term investments without recognizing the sustainable potential of investing in data science for years to come. A worrisome 82% say their company makes splashy investments that have short-term payoffs – including 46% who say this happens often or all the time.

This points to the notion that while executives have enormous expectations for revenue growth from their investments in data science, they are not making investments in the right places to truly unleash the power of data science. Furthermore, the data suggests that these companies would do better to properly scale data science by investing in cohesive, sustainable processes to develop, deploy, monitor, and manage models at scale.

Investing Wisely. High Maturity* companies are putting up the money necessary to get the most of data science: 76% have invested enough to meet their leaders' expectations. But at Low Maturity companies, just 38% of data executives say their leadership has invested enough into data science to meet their expectations.

Key Finding 2: The Role of Data Science is Unclear



If leaders want to get the most of their investments in data science, they need to treat the science with the respect it deserves. That is why a powerful 65% of companies that scored High* on Domino Data Lab's Maturity Index treat data science as a first-class discipline such as finance or marketing. Just 39% of all companies do the same – including a scant 17% of companies that scored Low. (See sidebar for more on how the Data Science Maturity Index was calculated.)

On The Back Burner. Many Low Maturity companies treat data science as support (41%), which does add value to a company – but it does not begin to tap the true potential of data science, as evidenced by the larger role it plays at more mature companies. Just 5% of High Maturity* companies relegate data science to a support role.

Great Expectations. Because they recognize the capacity of data science – and because they have more confidence they can deliver – High Maturity* companies have the greatest expectations for their data science: half (50%) say their leadership expects double-digit revenue growth, and another 35% expect single-digit revenue growth. But at Low Maturity companies, just 57% of data executives say their company leadership expects any revenue growth from data science, and 10% have no expectations at all.

Making It Count. On average, data science leaders say 58% of their models end up directly impacting business decisions – and those at mature companies are getting even more bang for their buck. An impressive 69% of data models at High Maturity* companies impact business decisions, compared to fewer than just 49% at Low Maturity companies.

Introducing the Domino Data Lab Maturity Index

The survey analysis assessed responses according to the Domino Data Lab Maturity Index. The Maturity Index incorporates the real-world data science processes that Domino sees companies use, described below in the matrix. The analysis aggregated the results to determine where responses fit on an organization's journey to data science maturity – including Low Maturity, Increasing Maturity, and High Maturity* levels. To achieve the highest stage of maturity, an organization has built a foundation for data science that has a major impact throughout the company and drives business decisions.

Survey findings revealed a huge gap between the most mature and least mature companies. Just 22% rate as High Maturity*; another 39% rate as Increasing Maturity; and 39% rate as Low Maturity.

Self-assessment of maturity revealed a major blind spot. Most High Maturity* companies (88%) accurately describe themselves as mature, but more than half of Increasing Maturity companies (57%) also see themselves as mature despite roadblocks keeping them from achieving the higher level. One third of Low Maturity companies (32%) consider themselves mature, which is a dangerous false sense of progress.

The Domino Data Lab Maturity Index

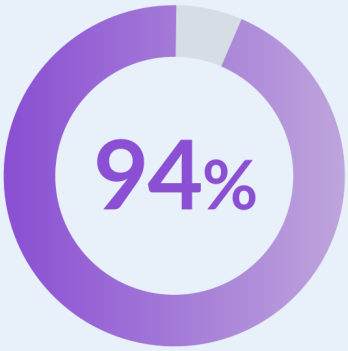
Level	Description	Structured Processes	Discoverability & Compounding	Analytical Speed & Agility	Breadth & Depth of Impact	Organizational Cohesion
High Maturity*	Optimized & Automated	Best practices codified into infrastructure, transparency for all	All asset versions stored / tagged, searchable, reproducible	Cutting-edge tools, comfortable at the analytical frontier	Data products drive org with robust safeguards	Analytics enmeshed in business; proactively anticipate needs
Increasing Maturity	Defined but Limited	Formalized process, manually enforced	Assets stored centrally but without full reproducibility	Some tools and talent investment	Results proved with integrations into some operational workloads	Collaboration with analytically-minded line managers
Low Maturity	Ad Hoc Exploration	Practitioners operate automatically in a black box	Assets stored locally, emailed around	Limited talent and tools	Ivory tower, no tangible value	Analytics island, purely transactional

*Data for this audience is among a sample of less than 100 respondents. Findings are directional.

Key Finding 3: Better Models Lead to Greater Revenues

Data science has big potential, which is especially appealing to big companies. Nearly one in three data executives at companies with 10,000 or more employees (30%) say their leadership expects double-digit revenue growth, nearly double the rate of their peers at smaller companies who say the same (16%).

But ultimately, it is not about the size of the company, but rather the way it treats data science that best represents how much the discipline can affect their business. Among companies that treat data science as a first-class discipline, 40% say data science models have made a great deal of an impact on their sales and revenue.



of executives in data science roles report that data science models impact their sales and revenue.

Asked Among 300 U.S. executives in data science roles

50% of High Maturity* companies report that their data science models have a "great deal" of impact on their sales and revenue.

Reaping the Rewards. A powerful 82% of High Maturity* companies have had data science make a great deal or fair amount of impact on sales or revenue, including 50% who say "great deal." Just 14% of Low Maturity companies say data science has had a great deal of impact on their sales or revenue – even as their High Maturity* peers show the potential to make significant gains when putting data science to work.

Level of Effort. Data science can have a powerful impact on a company's success, but data executives feel overwhelmed making it happen. More than two in three data executives (68%) report it is at least somewhat difficult to get models into production to impact business decisions –

and 37% say it is very to extremely difficult. But companies that understand data science and the proper procedures do not experience this frustration: 53% of data executives at High Maturity* companies have little to no difficulty getting models into production, more than double the 25% at Low Maturity companies who say the same.

Digital Graveyard. If a model fails, that investment can simply… disappear. More than three in four data executives (78%) have seen their companies stop a data science initiative or cut back investment if a data model fails, including 26% who say it has happened several times.

Key Finding 4: Unimproved Models Bring Higher Risk

Designing and implementing data models is not the end of the job: they need to be continuously updated to remain useful. But on average, nearly a quarter (23%) of models are not improved – in fact, 47% of Low Maturity companies let a quarter or more of their models go unimproved.

In the Red. Unimproved models are more than just inefficient or inconvenient: they can have disastrous effects on a company's bottom line. Data executives say the top consequences of unimproved models include wrong business decisions that lose revenue (46%) and faulty internal key performance indicators that impact staffing and compensation decisions (45%).

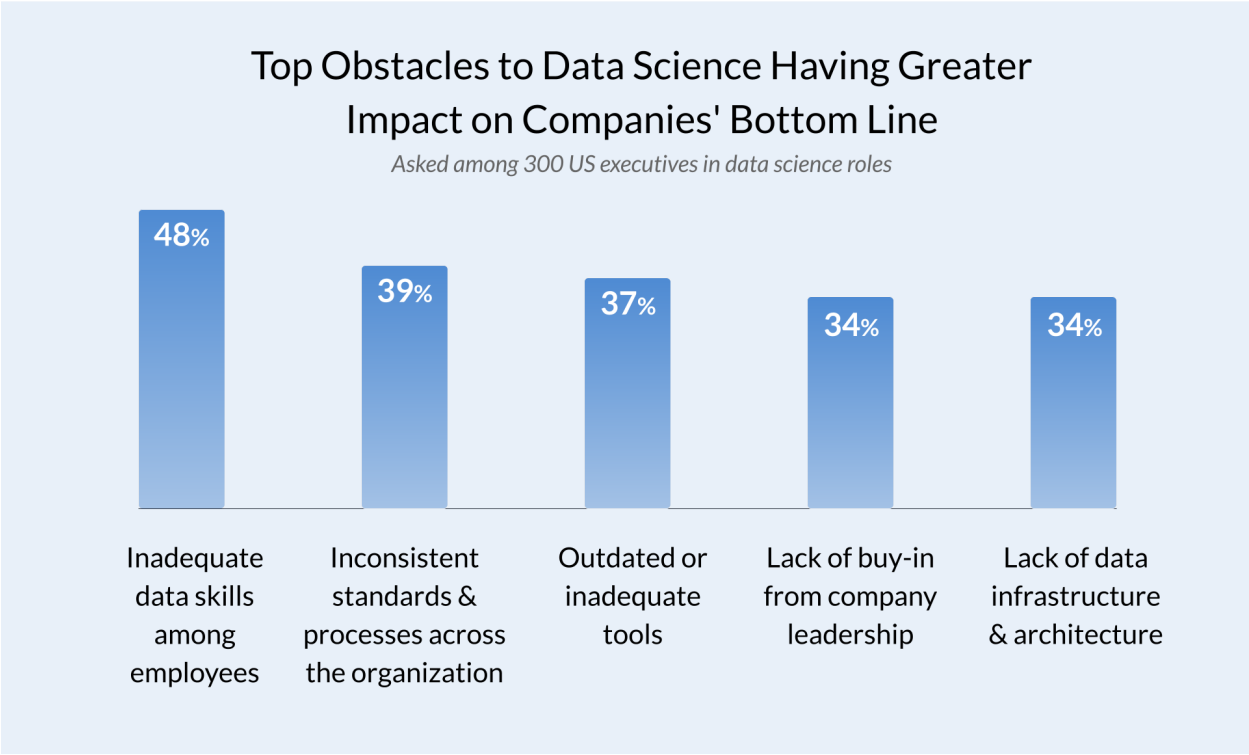
Sounding the Alarm. A third of data executives (33%) say not improving models can result in loss of productivity or rework, but they are also looking to the big picture of problems beyond inefficiency. More than two in five (43%) say not improving models can lead to security or compliance risks, while 41% say it could result in discrimination and bias in modeling.

Data Disasters on the Horizon. Data science has huge potential to improve companies and deliver major successes – but bad or failing models can also have consequences capable of destroying companies. An alarming 82% of data executives are concerned about major revenue loss or a hit to brand reputation stemming from bad or failing models.

Key Finding 5: Must Clear Key Obstacles to Achieve Goals

Operationalizing data science at scale requires the use of sophisticated tools and compute resources. But tools alone are not enough to get the job done. Survey respondents report some of the biggest obstacles relate to the people and processes required for launching production models at scale.

Look Within. The top obstacle to maximizing data science benefit is a lack of skills among employees (48%), but data executives are not letting their own processes off the hook. Nearly two in five data executives (39%) say a top obstacle to data science having a great impact on their company is the use of inconsistent standards and processes around the organization.



Senior managers are more likely to cite inadequate data skills among employees (61%) compared to senior executives (41%) and C-Level executives* (39%), respectively.

Lack of staff. Data executives' most common concerns over finding talented employees to manage their data science endeavors is another issue of investment: 44% say they simply have not hired enough. But those they have hired are also being used inefficiently. More than two in five data executives say their data science resources are too siloed off to build effective models (42%), and nearly as many (41%) say they have not been given clear roles.

Not enough talent. High Maturity* companies are less likely to believe they do not have enough talent; for them, the top issues for talent are talent that are too siloed (36%), do not have clearly assigned roles (36%), or are not the right type of data scientist that they need (36%). But their less mature peers still need more support to get started: Low Maturity (50%) and Increasingly Mature

companies (47%) are more likely to say a top issue is not hiring enough talent (compared to 26% of High Maturity* companies).

Additional Resources

The Practical Guide to Managing Data Science at Scale – A guide of lessons from the field on managing data science projects and portfolios.

Model Monitoring Best Practices – This whitepaper describes common reasons and types of model drift, and provides an overview of best practices for mitigating the risk of drift and monitoring to detect drift early.

The Total Economic Impact of the Domino Enterprise MLOps Platform – Forrester Consulting white paper projects that organizations that use Domino will realize nearly $30 million in value over a three-year period, with an ROI of 542% and a payback in less than six months.

About Domino

Domino powers model-driven businesses with its leading Enterprise MLOps platform that accelerates the development and deployment of data science work while increasing collaboration and governance. More than 20 percent of the Fortune 100 count on Domino to help scale data science, turning it into a competitive advantage. Founded in 2013, Domino is backed by Sequoia Capital and other leading investors. For more information, visit dominodatalab.com.