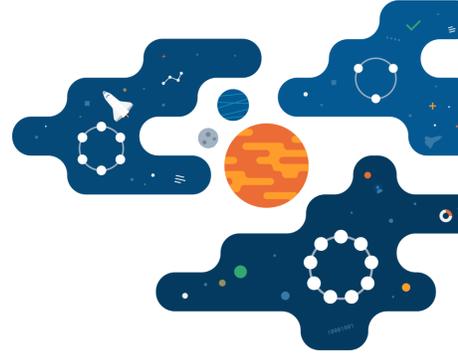


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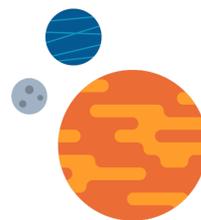
# The CIO Guide to a Data-Driven Enterprise

**Data-driven enterprises use data to redefine the value propositions they offer to customers, at a pace and scale that grows their business.**

To help executives and technical practitioners accelerate their progress toward this goal, DataStax conducted a large-scale global benchmarking survey.

This whitepaper summarizes key findings and provides an opportunity to benchmark where any organization stands in relation to the global leaders.

## The Future Won't Be Like the Past



“In January-March 2020 The Economist Intelligence Unit interviewed 24 top executives with direct responsibility for data strategy at enterprises in a range of industries across four major regions of the world. In a knowledge-based economy, the ability to generate data-driven insights will align more and more with companies’ overall competitiveness. More than two-thirds of companies the EIU surveyed said their profitability had increased over the past three years thanks to their digital strategy and nearly three-quarters expect it to rise in the next three years..”

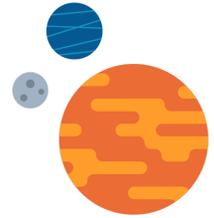
**NEW STRATEGIES FOR BETTER DECISION-MAKING**, THE ECONOMIST, JUNE 2020

By 2023, data literacy will become an explicit and necessary driver of business value, demonstrated by its formal inclusion in over 80% of data and analytics strategies according to the most recent Gartner Predicts report. CIOs who are aligning modern architectures, tools, processes and culture are gaining a competitive edge and leading the new data economy.

At DataStax, we are privileged and humbled to play a part in our customers’ data-driven transformations. We are committed to increasing access to empirical data to help our customers and the broader business and technology community go farther, faster. Recently FedEx, T-Mobile, Home Depot and Banco Santander have shared their stories on how they became a data-driven enterprise.



## CIOs Are on a Journey



In interviews with CIOs, we heard four stages of progress toward the data-driven enterprise.<sup>1</sup> We offer archetypal quotes in the table below (emphasis added).

<b>Pre-Digital</b>	"If I can't calculate the direct cost savings, it isn't happening."
<b>Building Capability</b>	"If I could make it so all of my applications were scalable to user demand... that would reduce the most amount of user pain..."
<b>Digital at Scale</b>	"I generate one terabyte of data every day. And I don't know what to do with this. So every month, I throw this away, I just delete it."
<b>Data-Driven</b>	"Data has been designated as a strategic asset, and understanding that data—orchestrating [it] with a common framework and glossary that can be used across the company—has become a key initiative..."

### Pre-digital

Despite the ubiquity of digital transformation initiatives, for some IT's mission remains focused on taking costs out rather than increasing effectiveness or driving growth.

### Building capability

Others have been making steady progress toward digital capabilities at scale. In some cases, the coronavirus crisis has provoked a reevaluation of the timeline. One CIO told us "if you had asked me my cloud strategy four months ago, I would have said, 'In ten years, I'll have maybe 40% of my stuff onto the cloud.' The goal now is to have 80% on in five years."

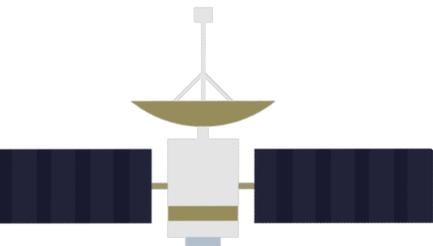
<sup>1</sup> Interviews were conducted on a double-blind basis by ClearPath Strategies on behalf of DataStax in April 2020.

### **Digital at scale**

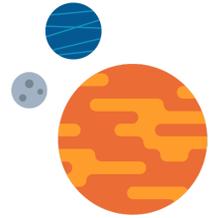
Another pattern was doing digital business at scale, but with a nascent--or even, in one case, non-existent data strategy. Data policy governs storage cost and security, but it is “on one’s job” to turn data produced in the course of doing business into a source of value.

### **Data-driven enterprise**

A few had both declared and operationalized a company-wide commitment to data as a valuable asset. The most forward leaning made a distinction between a “data-” and “AI-” driven, telling us “where you’re relying on human-driven analytics versus machine-driven analytics, [that’s the difference] between the data-driven and AI-driven enterprise.”



## Quantifying Progress



Based on 1:1 conversations, we designed a survey to quantitatively benchmark progress toward the data-driven enterprise.

In this white paper, we share the distribution of how 1,400 executives and technical practitioners in 13 geographies described their organizations. A simplified version of the scoring rubric enables readers to plot where they stand in relation to leading companies.

### Enabling conditions

A common topic amongst the companies that we surveyed were challenges around utilizing data for better decision making as a result of legacy architecture, policy and process. "Siloed data" was a strong theme. We designed questions to test three enabling conditions and one barrier:

- Data portability is very important to us
- Our data is highly portable
- Our data is highly scalable
- We can fully leverage AI with our existing data infrastructure

### Conditions for excellence

The most bullish companies were better able to apply machine learning and AI across the boundaries of business units of functions. Some new responsibilities and behaviors required board- and CEO-level decisions. We wanted to assess if conviction data was a strategic commitment, with C-level support, alongside technical practices:

- We have a data strategy
- Someone has the title or responsibility of Chief Data Officer
- We use big data and machine learning to enhance our IT Ops (AIOps)
- Use of AI/ML (Artificial Intelligence / Machine Learning)

Most questions were asked on a scale designed to capture intensity of feeling: For each of the following statements, rate how well it describes your company. Use a 1 to 5 scale, where 5 means "Very well" and 1 means "Not well." The higher the number, the better the statement describes your company.

## Progress Toward the Data-Driven Enterprise

% of Companies



### Leaders vs. Laggards

Fewer than one in ten companies (8 percent) can be fairly described as “not started” on the path toward the data-driven enterprise.<sup>2</sup> Conversely, while a full third have made substantial progress, just 10 percent report high scores on all eight of our measures. When we draw a hard line on use of AI, in production, at scale, the number drops to just one in twenty.

### Horizontal Scale for Cloud Native Applications

A majority of respondents described their compute strategy as “hybrid cloud.” But the distribution skews toward the more accomplished data-driven enterprises. Nearly two-thirds of the most advanced companies versus less than half of those not started.

Deployment of other technologies was even more stark. Just over half (52 percent) of the “AI leaders” say they are mostly building cloud native applications today. Consistent with making the most of horizontal scalability for applications and data, 48 percent are using Kubernetes and nearly a third have Apache Cassandra deployments.

Only five percent of those who have not started on the path toward the data-driven enterprise are mostly building cloud native applications. The same number are using Kubernetes, while none have deployed Cassandra.

<sup>2</sup> We surveyed a total of 1,404 CIOs and technology executives (n=503) and technical practitioners (n=901) in the US, China, Germany, the UK, Brazil, France, India, Mexico, the Netherlands, South Korea, Japan, Ireland, and Argentina during April 2020. Because respondents were anonymous, it is possible that some respondents worked in the same organization. For the purpose of this report we treat respondents as equivalent to companies.

### *Why We Believe Intensity Matters*

On the one hand, you might say that whether an organization has a data strategy or not is a binary, “either or” question. But major change in large organizations requires more than just “ticking the box.” For a question like this, we expect that a response that this describes my organization “not at all well” (which we score as a “1”) is likely an answer of “no.” But in our experience the option to respond that this describes my organization “very well” (which we score as a 5) versus an intermediate response of 2, 3, or 4 exposes fault lines where (for example) a document might be more like shelfware than the expression of a true transformation of culture, practices, and incentive structures.

### **The Future of Digital Transformation is Data-Driven**

We were initially surprised to find that there was only a weak positive association between how advanced companies were on their digital transformation efforts and whether or not they had appointed a chief data officer and built a data strategy.

However, once we dug in to whether respondents described their organization as risk-averse or forward-leaning, the connection sharpened. Organizations at an advanced stage of digital transformation that also had high scores on “We generally lean into innovation” are 3.5 times as likely to have a chief data officer and a data strategy in place.

### **Data Can Fuel Efficiencies and Growth**

The long-term economic potential of data-driven enterprises and AI to reduce waste and drive growth industries is widely accepted. But today’s leaders show why progress matters now. Nearly one third of the leaders on the data-driven enterprise journey are accelerating investment in digital in response to the coronavirus crisis; those who have both a cloud-native tech stack and a data strategy in place are more than two-and-one-half times more likely than others to be doing the same.

### **DDE Benchmarks**

The next section provides you the opportunity to benchmark where your organization stands in relation to those we surveyed. We hope it helps identify “next best steps” toward the data-driven enterprise.

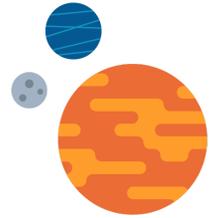
One thing seems clear: leadership from the top is vital. When we analyzed progress toward data portability, scalability, and the ability to do AI in relation to other organizational practices and commitments, one call to action jumped out.

Organizations with both a designated chief data officer and a data strategy were four times more likely to have made substantial progress than those without.

Historian Nancy Koehn, author of *Forged in Crisis: The Power of Courageous Leadership in Turbulent Times*, describes Inspiring a sense of mission while reminding people why their work matters as a key way some of history's greatest leaders helped people through crises.

If you are already in the role of "chief data officer," our data validates that your work matters. If your organization has not yet assigned that mission, doing so is a proven pattern for accelerating progress.





## (A) Collect data

The following questions will enable you to make approximate comparisons to the distribution of survey responses. While the design of this research project was based on an expectation of one respondent describing his or her company, we have seen powerful team exercises in which multiple people answer the questions without looking at each other's results until they are all tallied.

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*Rate how well each statement describes your organization. Use a 1 to 5 scale, where 5 means "Very well" and 1 means "Not at all well." The higher the number, the better the statement describes your organization.*

1. We have a data strategy
2. Someone has the title or responsibility of Chief Data Officer
3. Data portability is very important to us
4. Our data is highly portable
5. Our data is highly scalable
6. We can fully leverage AI with our existing data infrastructure
7. We use big data and machine learning to enhance our IT Ops (AIOps)

*Does your organization use, plan to use, or has a plan to use:*

8. AI/ML (Artificial Intelligence / Machine Learning)

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## (B) Assess where you stand

The table below shows a breakdown of responses in the full dataset, organized so that you can compare responses from your organization on three dimensions:

- 
- Do you have **enabling conditions** such as portable and scalable data? Among those reporting the least progress, for example, “data portability” is not yet a priority.
  - Do you have in place **conditions for excellence**? This includes both as a data strategy to guide company-wide change as well as the ability to use machine learning to automate management of data at the ever-increasing scale that implies.
  - Is there an **intense and consistent affinity** for the characteristics of the data-driven enterprise in responses at your firm? The top five percent of survey respondents felt key attributes described their firms “very well” nearly across the board.
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We encourage this benchmarking to be conversational and used to spark further inquiry. We intentionally do not provide a way to calculate point scores, because “a 67 means we’ve no more work to do, but a 44 means we’re failing” is not a helpful exercise.

Rather, If you look less like a leader than you expected, we hope it builds the case for urgency and action. And If the reverse is true, we hope it generates enthusiasm for continuing to aim high for “what’s next.”

## PERCENTILE OF COMPANIES

## SCORES AND CHARACTERISTICS

### 95th

The top 5% of companies stand out as **AI-Driven Enterprises**. They report both the greatest active ability to leverage their data as well as the highest level of organizational traction:

- Have a clearly defined data strategy (5)
- Have a Chief Data Officer or someone with the responsibilities of a CDO (5)
- Use big data and machine learning to enhance our IT Ops (AIOps) (5)
- Are using AI/ML
- Have highly portable, highly scalable data
- View having portable data as a high priority

### 90th

Altogether, the top 10% of firms are **DDE Leaders**. The large majority of these organizations:

- Have a data strategy
  - Have a Chief Data Officer or someone with the responsibilities of a CDO
  - Are using AI/ML
  - Use big data and machine learning to enhance IT Ops (AIOps) to some degree
  - Have highly scalable, highly portable data
  - View having portable data as a priority
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<b>67th</b>	<p>The top third of firms show <b>DDE Maturity</b>. These firms:</p> <ul style="list-style-type: none"> <li>• Have a data strategy</li> <li>• Are using or planning to use AI/ML</li> <li>• Have scalable data</li> <li>• Have portable data</li> <li>• View data portability as at least somewhat important</li> </ul>
<hr/>	
<b>45th</b>	<p>In the middle of the DDE curve, 22% of firms are in <b>DDE Adolescence</b>. While these firms are on the journey, they are still building enabling conditions:</p> <ul style="list-style-type: none"> <li>• Are using or planning to use AI/ML</li> <li>• Have somewhat scalable data</li> <li>• Have somewhat portable data</li> <li>• View data portability as somewhat important</li> </ul>
<hr/>	
<b>21st</b>	<p>The bottom fifth of firms, 21%, are <b>Falling Behind</b> on the DDE scale. These firms:</p> <ul style="list-style-type: none"> <li>• Are using or planning to use AI/ML but cannot fully leverage AI with their existing infrastructure</li> <li>• View data portability as only somewhat important</li> </ul>
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<b>8th</b>	<p>The bottom 8% of firms have effectively '<b>Not started</b>' their data-driven enterprise journey. They:</p> <ul style="list-style-type: none"> <li>• Neither have nor prioritize data portability</li> </ul>

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