About the author

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Executive Summary

Most enterprises place a high importance on data. Being data-driven requires making sound business decisions using the data that a company has available. Thus, the trend in recent years has been toward collecting as much data as possible. But generally the data attained is not being used efficiently or effectively. Therein lies the conundrum – enterprises want to be strongly data-driven, but this is easier said than done. Limited budgets, security concerns, skilled resources and integration with legacy systems are just a few of the challenges that enterprises face on the road to being data-driven.

Becoming data-driven won’t just happen on its own. There are recommended best practices that enterprises may employ, starting with building a strong data foundation. Enterprises can collect volumes of data of varied types, which can help streamline data access, and run queries that utilize different models. With a foundation in place that supports front-end systems of engagement, enterprises are better positioned to drive analytical processes, including systems of intelligence, which utilize machine learning and other advanced analytics methods. Doing so enables enterprises to reap a multitude of benefits that range from improving new products and services to reducing costs and enhancing customer engagement.

Recognizing the Importance of Data

Enterprises of all shapes and sizes are recognizing the value of data like never before. They are proactively undertaking strategic efforts to use data to make operational business decisions and operational improvements, including organizational changes, measuring performance and improving customer engagement. We define such enterprises as being ‘data-driven.’ While the benefits of being data-driven are numerous and varied, 451 Research’s Voice of the Enterprise: Data & Analytics surveys of enterprise decision-makers have consistently shown that realizing operational efficiencies and overall lower costs are among the most significant.

The importance of leveraging good data has long been recognized, but it has come into sharper focus in recent years as enterprises seek to become more data-driven – using data and analytics to accelerate business decision-making throughout all facets of the organization. Respondents to 451 Research’s Voice of the Enterprise: Data & Analytics: Data Platforms, 1H20 survey were asked about the value their firms expect to place on data going forward. Overwhelmingly, to the tune of 82%, respondents say they expect data to have greater importance to their decision-making in the near future.
While it makes sense that enterprises continue to place high value on data, it’s also worth noting that they expect to increase the amount of data they have under management. According to 451 Research’s Voice of the Enterprise: Data & Analytics, 2H 2019 study, the median data volumes – including both structured and unstructured data – that enterprises currently have under management is now greater than 630TB, and this figure is expected to exceed 820TB within two years. The importance of data, combined with its expected growth, creates a cyclical process: the more data that is generated and captured, the more data is valued within the enterprise.
Benefits of Being Data-Driven

Collecting enormous amounts of disparate data while also placing high importance on this data has its benefits. There are good reasons why enterprises want to be more data-driven. 451 Research’s Voice of the Enterprise: Data & Analytics 2H 2019 study also revealed that except for increasing competitive advantage/responding to competitive threats (cited by 25% of respondents), the expected benefits of being data-driven can be divided into two main groups: deriving new business value and improving efficiency.

Figure 2: Benefits of Being More Data-Driven
Source: 451 Research’s Voice of the Enterprise: Data & Analytics 2H 2019
Q. What are the most significant benefits your organization would expect from being more data-driven?
Please select up to three.
Base: All respondents (n=361)

<table>
<thead>
<tr>
<th>Benefit</th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
<td>Improving existing/developing new products and services</td>
<td>27%</td>
</tr>
<tr>
<td>Lowering costs</td>
<td>27%</td>
</tr>
<tr>
<td>Enhancing customer service and engagement</td>
<td>26%</td>
</tr>
<tr>
<td>Increasing sales</td>
<td>25%</td>
</tr>
<tr>
<td>Increasing competitive advantage/responding to competitive threats</td>
<td>25%</td>
</tr>
<tr>
<td>Improving/automating business processes</td>
<td>22%</td>
</tr>
<tr>
<td>Empowering and aligning internal decision-makers</td>
<td>20%</td>
</tr>
<tr>
<td>Reducing risk exposure</td>
<td>19%</td>
</tr>
<tr>
<td>Improving business agility</td>
<td>19%</td>
</tr>
<tr>
<td>Improving regulatory compliance</td>
<td>18%</td>
</tr>
<tr>
<td>Developing new data monetization services</td>
<td>15%</td>
</tr>
</tbody>
</table>

Overall individual responses related to deriving new value slightly outweighed those related to improving efficiency (46% to 43%). Yet one response from each group – improving existing/developing new products and services and lowering costs – tied for most important, with 27% of respondents each. Enhancing customer service and engagement and increasing sales – both related to deriving new value – follow with 26% and 25% of respondents, respectively.
Barriers to Becoming Data-Driven

Optimism can fade quickly as enterprises realize that becoming data-driven is a nontrivial effort. 451 Research’s Voice of the Enterprise: Data & Analytics 2H19 study found numerous barriers related to being more data-driven. Limited budget was the top-cited barrier with 27% of respondents, followed by data privacy concerns (24%), not enough skilled resources (23%), and integration with existing/legacy data architecture (23%). Data security, with 20% of respondents, rounded out the top five barriers according to IT decision-makers.

Figure 3: Barriers to Being More Data-Driven

Source: 451 Research’s Voice of the Enterprise: Data & Analytics 2H19

Q. What are the most significant barriers your organization faces in attempting to be more data-driven? Please select up to three.

Base: All respondents (n=361)

But barriers vary between organizations. Data privacy concerns and regulatory compliance requirements, for instance, are cited as the most significant barriers among respondents from companies that consider themselves highly data-driven. Respondents from organizations that consider themselves the least data-driven are significantly less concerned about regulatory compliance, which can be attributed to a lack of maturity. Among these less data-driven enterprises, a limited budget is the biggest barrier, followed by a lack of skilled resources.
Begin With Data Platform Selection

Becoming data-driven is an evolutionary journey that begins with a strong data platform foundation. Respondents to 451 Research’s Voice of the Enterprise: Data & Analytics 2H19 survey were asked what factors they considered when selecting their data platform systems. Respondents reported that cost, performance, security, reliability and scalability – in that order – were their top considerations.

It makes sense that cost ranks high because it is connected to other system traits. For instance, an unreliable system requires excessive administrative efforts, while poor database security results in unexpected data breaches that require significant expense to rectify.

Multi-Model Data Processing

While enterprises often choose their data platform systems based on a collection of specific traits – cost, performance, security, reliability and scalability – they should also consider how these traits will be implemented architecturally, and the impact they will have on the workloads those systems will run.

Enterprise data growth is expected to remain high going forward. Having a strategy around how to handle this mass of data should be a priority when enterprises choose their data platform systems. Unfortunately for many organizations, collecting significant amounts of data, including disparate data types, leads to data silos, which creates data sprawl. Data sprawl can lead to other data management challenges such as high costs, inefficient use of resources, poor data governance and even data security risks. Data sprawl can also impact performance, scalability and reliability.

One way to address the challenge of data silos is by implementing a multi-model data platform system – as opposed to implementing disparate data platform technologies for each workload, which is generally referred to as polyglot persistence. This may work well for certain niche applications, but when it is done at scale, it can raise administrative complexity headaches as IT tries to manage multiple platforms, each requiring specialized skills. Because multi-model systems are designed to handle different data models, they are effective at running varied workloads while also reducing overall administrative costs because there are fewer systems to maintain.

Respondents to 451 Research’s Voice of the Enterprise: Data & Analytics, Data Platforms 1H20 survey were asked about their preference for multi-model systems. Overwhelmingly, respondents agree (with 41% completely in agreement and 40% mostly in agreement) that their organizations prefer multi-model systems. Of course, a multi-model system may not be a workable approach for all enterprises, but those who don’t favor them are clearly in the minority (11% mostly disagree while 7% completely disagree).
The preferred way to address the issue of polyglot persistence is with multi-model data platform systems – systems that can house different data types within the storage layer, thus eliminating the need for multiple specialized systems. These systems address many of the barriers that enterprises face, while at the same time providing a variety of benefits.

- **Fewer systems to manage:** Multi-model systems enable enterprises to implement data consolidation, leading to fewer systems that need to be maintained. With fewer systems, enterprises realize several benefits: a need for fewer database administrators, the ability to provide a single security model instead of maintaining several, and simplified efforts to upgrade and apply system patches and fixes.

- **No data movement:** Multiple systems will require data movement, but the issue is more than simply moving the data; it often requires manipulation or applying ETL processes to the data as it moves from system to system. Multi-model systems reduce the need to move data, thus eliminating the time penalty involved in moving it.

- **Extend the life of legacy systems:** Many enterprises struggle to integrate legacy systems with new data platform systems. Part of that challenge stems from ever-changing data types and models. For example, relational data has been around for 50 years, but JSON data is quickly becoming popular. Both formats can be stored in a multi-model system that can be easily queried.
• **Streamline data access:** More data creates more data platforms, each coming with its own set of users that need access to the data. Multi-model systems greatly streamline data access, providing not only broader access – because it’s centralized – but also access that can be efficiently managed.

## Data Drives Systems of Engagement, Analysis and Intelligence

When organizations implement data platform systems that can handle disparate data models and high data volumes, they are in a much better position to make the jump from just storing and managing data to becoming truly data-driven.

Becoming data-driven starts with the data that resides in the enterprise’s system of record, which integrates with several other systems, including systems of engagement, which manage customer interactions; systems of analysis, which provide the analytical capabilities for the enterprise; and systems of intelligence, which provide intelligence-driven insight based on artificial intelligence (AI) and machine learning (ML) capabilities. How systems of record, engagement, analysis and intelligence interact is illustrated below using the example of a traditional retail store (see Figure 5).

*Figure 5: Systems of Engagement – Retail Example*

*Source: 451 Research*
In the retail example, the engagement with the customer thus far has been performed by the employee, who may make suggestions and recommendations and answer questions. Assuming a purchase is made with cash, the transaction also occurs in the physical world, before details of both the transaction and the engagement are recorded in the retailer’s systems of record – the ERP or financial and CRM applications.

Systems of intelligence improve individual experiences with data that is updated constantly (e.g., transactions, events, contexts, interactions and behaviors) and tied to a unique identity for each customer, to build a complete customer profile. Then that information and identity must be turned into prescriptive insight using machine-learning-based algorithms to identify customer opportunities and determine how to best engage with customers across multiple channels and devices.

For instance, chatbots and digital assistants can answer questions and make suggestions along with recommending purchases based on previous transactions. Smart bots and robotic process automation (RPA) can drive customer-engagement scenarios that provide personalized, structured responses, as well as automating services and business workflows.

These interfaces between the enterprise and the customer – the application, digital assistants, smart bots and chatbots – are the new systems of engagement, but they need to be driven by intelligence, which is fed by the data. Specifically, new systems of engagement are enabled by rules engines, decisioning systems, recommendation engines, natural language processing, image recognition and other forms of artificial intelligence.

**AI/ML Play an Integral Role in Becoming Data-Driven**

Systems of intelligence are driven by AI and ML. There is a natural relationship between AI/ML and the core systems of the platforms that are enabling companies to be more data-driven. Becoming data-driven effectively means large-scale data analytics, insight and automation. Because being data-driven is a top priority of many organizations, companies view AI/ML initiatives as integral to the effort. In 451 Research’s Voice of the Enterprise: AI & Machine Learning Use Cases 2020 survey, 93% of respondents report that AI plays an important part in their digital transformation efforts (Figure 6).
There are caveats to integrating AI/ML on the road to becoming data-driven. For instance, machine learning won’t work if the data is rigidly siloed, further highlighting the importance of implementing the right data platform system. If, for example, financials, HR data and contracts are all in discrete systems – and nothing has been done to create connections between these silos or bring the data together – then the organization is not ready for machine learning and may as well use standard analytics tools in each silo.

The bottom line is that for systems of intelligence to be effective, they require data to be readily accessible. How much data is required all depends on the problem being solved, and the data and algorithms being used.
Conclusion

Many organizations are recognizing the increasingly important role that data plays in the enterprise, fueling their desire to become more data-driven – that is, leveraging data to make operational and strategic business decisions. It has been said that those who own the data (and manage it) will win; everyone else will pay for access. The value lies in the data itself, and enterprises that manage their data well will be much more competitive in their given markets than those that don’t.

There is not always a clear path to managing one’s data well, and there are certainly challenges along the road. Most enterprises learn that becoming more data-driven is far easier said than done. There are some best practices that enterprises can employ to become more data-driven, though. Putting the focus on data is a crucial step and, at its core, means understanding the role that data plays in driving systems of record, systems of engagement, systems of analysis and systems of intelligence.

One way to ease the journey to becoming data-driven is to implement systems that can handle legacy data, as well as scale to manage new data formats as they come along, including data that may be used for machine learning activities. Polyglot persistence might be fine for one-off workloads, but that model soon breaks down at scale, burdening enterprises with technical debt. Multi-model systems were designed to fix that. When multi-model systems are implemented correctly, enterprises are well on the way to becoming data-driven and can reap a multitude of benefits, from improving products and services to reducing costs and enhancing customer engagement.
About 451 Research

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