

# The Demise of Big Data, Its Lessons and the State of Things to Come

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Information and analytics leaders in mid-2015 have advanced beyond treating new data sources and technologies as unfamiliar. They are shifting focus from ad hoc investments to infrastructure-level deployments delivering on strategic business needs and forcing enterprise architectures to evolve.

## Impacts

- Because analytics using multiple data sources and structures has become the norm, information architects must focus on adapting to new data quickly, and on coherently managing diverse information and analytics.
- The demand for advanced features is forcing new technology vendors to mature faster and traditional technology providers to close functional gaps quickly.
- In order to face constant technology innovation, many organizations have started integrating innovations by taking bimodal approaches to information infrastructure.

## Recommendations

Information and analytics leaders:

- Determine your business demand for implementing mature big data solutions. If demand is immediate or acute, then take a best-of-breed (BOB) approach when necessary.
- Compare your internal best practices to the best practices and standards in the broader market.
- Exploit new technologies while adding the command-and-control solutions of traditional technology in a hybrid approach that offers workload management. Seek solutions that specifically integrate with the existing enterprise infrastructure.
- Accept the addition of new technologies in your information infrastructure using a best-fit engineering approach to support new experimental requirements, but plan for production-ready capabilities.

## Strategic Planning Assumption

Through 2018, 90% of deployed data lakes will be useless as they are overwhelmed with information assets captured for uncertain use cases.

## Analysis

In 2015, Gartner retired the popular "Hype Cycle for Big Data." Retiring a popular research document is never easy, but we did it to move the big data discussion past hype and into practice. Also, we did it because Hype Cycles consider any adoption trend that goes beyond 20% of the wider IT market to be past hype and entering into early market definition. Big data investment has begun stabilizing over the past 12 months, coinciding with Big Data entering the Trough of Disillusionment in 2015 (see "Hype Cycle for Information Infrastructure, 2015"). This is the maturity phase, when early gains are consolidated and best practices and standards start to develop. Beginning in the first quarter of 2014, big data started transitioning from its own category into distinct Hype Cycles for enterprise information management, information infrastructure, business intelligence and advanced analytics:

- "Hype Cycle for Advanced Analytics and Data Science, 2015"
- "Hype Cycle for Business Intelligence and Analytics, 2015"
- "Hype Cycle for Enterprise Information Management, 2015"
- "Hype Cycle for In-Memory Computing Technology, 2015"
- "Hype Cycle for Information Infrastructure, 2015"

Big data isn't expected to become the new normal — or just data — for the broadest parts of the IT market until 2020. It will take time for infrastructure and architectures to mature. Best practices must be developed and refined against these architectures. Finally, skills and capabilities must be broadly available and accessible. However, recognizing that these things are already beginning allows enterprises to think about impacting specific business outcomes instead of being enamored with (or bewildered by) big data.

In 2010, big data was hyped as a significantly different information management and technology concept. It was driven by new technologies and data sources that are influencing today's emerging standards, when IT vendors market new solutions targeting opaque business challenges and outcomes. However, big data hype is now being replaced by practicality, because the technology and information asset types offer new alternatives that are most often additive or complementary to long-standing, traditional practices. This type of overhyped evolution will happen again. When it does, information and analytics leaders should recognize it for what it is.

Figure 1. Impacts and Top Recommendations for Information and Analytics Leaders

Impacts	Top Recommendations
<p>Because analytics using multiple data sources and structures has become the norm, information architects must focus on adapting to new data quickly, and on coherently managing diverse information and analytics.</p>	<ul style="list-style-type: none"> <li>• Determine your business demand for implementing mature big data solutions. If demand is immediate or acute, then take a best-of-breed (BOB) approach when necessary.</li> </ul>
<p>The demand for advanced features is forcing new technology vendors to mature faster and traditional technology providers to close functional gaps quickly.</p>	<ul style="list-style-type: none"> <li>• Compare your internal best practices to the best practices and standards in the broader market.</li> <li>• When using a BOB approach instead of a best-fit engineering approach, recognize that the integration costs of BOB may be substantial.</li> </ul>
<p>In order to face constant technology innovation, many organizations have started integrating innovations by taking bimodal approaches to information infrastructure.</p>	<ul style="list-style-type: none"> <li>• Embrace Mode 2 for fast experimentation over emerging business innovation requirements, and allow for the inclusion of new technologies (as required) using a best-fit engineering approach.</li> </ul>

Source: Gartner (August 2015)

## Impacts and Recommendations

Because analytics using multiple data sources and structures has become the norm, information architects must focus on adapting to new data quickly, and on coherently managing diverse information and analytics

The new expectation for information assets — that multistructured assets will be mixed freely in analytics and the broader data management environment — means that, from this point forward, everyone must sometimes address unfamiliar data. Too often, the default standard is adapted for use with less familiar assets and mistakenly pushes standards and applications into well-understood and well-optimized practices. This new "multistructured" expectation was at the core of big data hype. Multistructured data has been popularly understood as log data, text, geospatial information, sensor or machine data, and social media data, among others. These data sources are anything but unstructured, and they often were familiar to one architect and user community, but completely foreign to another. If "familiarity breeds contempt," then unfamiliarity breeds anxiety.

Information asset management had become increasingly complacent in using existing solution designs. At the same time, our inquiries with leading organizations have revealed traditional information themes around data governance, availability of skills and vendor selection criteria. Big

data has taught us that evolution in the information management, integration and analytics spaces is primarily driven by the discovery of complementary practices, not replacements. Big data projects are frequently isolated, leading to the creation of more data silos throughout the organization. A principle challenge is cohesively managing not only diverse sets of data and technologies, but also the analytics and access control.

Emerging challenges are already past the novelty of big data being some "exotic thing," and the core element driving that maturity is familiarity. By "familiarity," implementers mean familiar use cases and problems solved with familiar practices, tools and processes. Many implementers add that sometimes the use case or solution architecture is completely new, but, with practiced utilization, it, too, becomes familiar.

#### *Recommendations:*

- Track pilot and proof-of-concept (POC) efforts addressing new information assets. When these pilots or POCs begin to exhibit integration beyond their original use cases, determine their candidacy for following standards.
- When encountering a new information asset type, determine whether it is similar to any existing assets already in use for analytics, or under an existing integration solution. Develop a set of standards to determine a "distance" from existing solutions, and introduce a standard for when new integration approaches, data processing or analytics should be considered.

#### The demand for advanced features is forcing new technology vendors to mature faster and traditional technology providers to close functional gaps quickly

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The demand for "enterprise class" solutions in big data has accelerated the expectation for maturity in a variety of functional areas. The popular, although misguided, belief is that IT practices and architectures change every two years. This time frame is influenced by CPU release cycles (which are actually annual), but these are the most rapidly changing element in IT. Memory is only slightly slower. Storage innovates more slowly, and networks even slower than that. Thus, the refresh rates for infrastructure — and the software running on it — actually are closer to eight years.

Big data technology origins follow this same pattern. The commercialization of popular technologies created early in the previous decade is reaching the first wave of market adoption, and technology is maturing. However, the demand for advanced features (such as distributed optimization, process control, integration with existing infrastructure and governance) is just getting underway today. New technology providers face increasing pressure to implement these features.

Traditional technology providers have not been idle. Many began to aggressively extend existing products and solutions in order to embrace new processing models and analytical methods in 2013, if not earlier. The financial and R&D assets these firms possess allow them to close functional gaps quickly. This presents a narrow window in which new vendors can mature. Today, that window may be as small as 18 months. After that, consolidation begins. Immature but promising solutions will be acquired, with only a small number left standing by 2020. The rest will experience a slow decline, with some carving out places as niche players.

#### *Recommendations:*

- Determine your business demand for implementing mature big data solutions. If demand is immediate or acute, then take a BOB approach when necessary. For providers lacking complete enterprise solutions, exploit their new technologies opportunistically. Add the command-and-control capabilities of traditional technology in a hybrid approach that offers workload management, security and semantic access, and that supports common languages.
- Seek point solution technologies (for examples, see "Cool Vendors in Big Data, 2015") that specifically integrate with existing enterprise solutions and infrastructure. This will likely be through subordination or coequal status. This is one aspect of best-fit engineering.
- When using a BOB approach instead of a best-fit engineering approach, recognize that the integration costs of BOB may be substantial.
- Compare your internal best practices to the best practices and standards in the broader market.

### In order to face constant technology innovation, many organizations have started integrating innovations by taking bimodal approaches to information infrastructure

Since traditional enterprises are afraid of new digital disrupters entering their markets, the acceptance of more experimentation and technology diversity outside defined corporate standards is becoming the norm. However, while this is important to allow the innovation and agility required for this era of digital transformation, it should not justify "permanent pilot" approaches. Digital transformation will require production-ready solutions that can become Mode 1. Technologies used in experimentation may not meet the requirements, service-level agreements or governance requirements of production. Complete reimplementations of the solutions for production use may be needed.

Organizations need to be prepared to face constant technology innovation (see "Organizing for Big Data Through Better Process and Governance"). Many have started integrating innovations by taking bimodal approaches to information infrastructure — that is, keeping Mode 1 stable for production and enterprise-ready requirements, while implementing experimental solutions with more rapid iterations in Mode 2. This bimodal approach allows IT solutions to address business innovation, which also drives technology fragmentation.

The high rate of technology and business innovation is likely to continue as new use cases and new "exotic" data sources are added. New asset types, new types of processing, and different service-level expectations in new use cases will sometimes force existing infrastructure to adapt and, at other times, demand point solutions. However, the new emphasis will be found in how point solutions can be integrated into existing infrastructures, rather than building entirely new infrastructures around these point solutions. This is why best-fit engineering will grow in demand (a single functional operation or a small number of functional operations that are intended to integrate with existing solutions) while, simultaneously, new market solutions will have comparatively low market revenue "ceilings" within the much larger data management markets (greater than \$40 billion).

#### *Recommendations:*

- Embrace Mode 2 for fast experimentation over emerging business innovation requirements, and allow for the inclusion of new technologies (as required) using a best-fit engineering approach.
- Utilize a framework of expected information infrastructure capabilities (see "Introduction to Gartner's Information Capabilities Framework") to keep track of the various capabilities that are being addressed in the organization. Prior to extending the infrastructure, perform a gap analysis to see whether the addition is justified.
- Be prepared to rearchitect and redevelop solutions when going from experimentation to production. Experimentation, by nature, allows for more flexibility than production.

## Gartner Recommended Reading

*Some documents may not be available as part of your current Gartner subscription.*

"Predicts 2015: Information Infrastructure Technology Rewrites, Refreshes Rules"

"What Apache Spark Means for Big Data"

"Seven Best Practices for Your Big Data Analytics Projects"

"Big Data Needs a Data-Centric Security Focus"

"Making Big Data Normal Begins With Self-Classifying and Self-Disciplined Users"

"Maverick\* Research: How Big Data Causes Business Meltdown"

"Big Data Best Practices in Insurance: Lessons Learned From Early Adopters"

"Move to New Technology for Analytics on Fast Big Data"

"Architecting New Velocity Needs With In-Memory Computing and Big Data"

### Evidence

The evidence for this research comes from inquiries with Gartner clients, Gartner big data adoption surveys, and webinar attendee surveys and analyses.

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