

# Three Steps to Building a Long-Term Big Data Analytics Strategy

Advancing to infrastructure and operations analytics maturity



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## Executive Summary

Using data analysis to drive competitive advantage is a growing trend in the digital enterprise except in most IT organizations, where analytics remains limited to diagnosing problems after the fact. **To play a more strategic role, IT should leverage analytics in proactive, forward-looking ways** to exploit IT data and discover new opportunities for business growth and competitiveness.

To fulfill their strategic potential, IT organizations must undertake a journey to analytics maturity. This white paper presents a **phased approach** to complete this journey:

- Developing an **integrated, holistic approach to data collection** to replace siloed tactical reporting
- Applying **machine learning** in tandem with **data science best practices** to find the right answers to the right questions
- Enabling a true dialogue with the business by **testing hypotheses** through data access, search, and exploration

By advancing its analytics maturity, IT can make a direct, substantial impact on revenue, costs, and risks and strengthen its value to the business.



## UNDERSTANDING THE NEED FOR ANALYTICS MATURITY

Data analysis can serve two purposes in the enterprise. The first is familiar to most IT organizations: determining root cause of a problem or event after it occurs. While this type of analytics is highly valuable and important in operational terms, it is also essentially passive and backward looking. Root cause analysis is designed to ensure optimal performance and availability of a system or capability rather than to achieve a larger business impact.

The second type of analytics uses data to inform current and future business decisions, such as identifying an opportunity to drive competitive advantage by making strategic investments, capitalizing on emerging customer needs, or moving to more-effective business or operational models. This type of analytics is growing rapidly in the enterprise as part of the trend to adopt advanced Big Data technologies and practices. Ironically, many IT departments are well aware of this development because of their work to deliver more-strategic analytics tools for business units. Yet IT's own data exploration remains limited to tactical uses more similar to reporting than true analytics.

Now, as the era of the digital enterprise makes it essential for IT to play a more strategic role, leading IT organizations are looking to develop the ability to explore data more deeply and holistically to guide forward-looking decisions. In the words of Gartner, “Thanks to digital, CIOs have an unprecedented opportunity to transform themselves and their departments, and become a key voice at the executive table and boardroom.”<sup>1</sup> The questions IT leaders face are where and how to begin.

The first thing to understand is that **analytics maturity is a journey, not an overnight transformation**, involving:

- **Critical shifts in mindset, skills, and processes, as well as adoption of new technologies**
- **New definitions of success** based on a deeper understanding of IT's role in the business
- Learning and embracing **established best practices from data science**, such as figuring out which questions to ask to obtain the right information

**This journey can be understood in three phases:**



Integrated data capture  
and ingestion



Machine learning aligned with  
data science best practices



Data access, search,  
and exploration

Each phase offers incremental value for IT and the business, and involves important implications for IT skills and technologies, as well as the defined business advantage, cost optimization or risk mitigation results it can hope to achieve.

### PHASE 1 – INTEGRATED DATA CAPTURE AND ORGANIZATION

As any good data scientist will tell you, an effective analytics exercise begins by **defining the question** you want to answer and knowing which data you'll need to collect to answer it. For tactical use cases such as root cause analysis, IT has generally focused on the data specific to a single solution, creating reports around that functional area in hopes that it will reveal insight into trends that might impact functionality. This narrow approach may be effective for resolving issues, but the development of a more strategic analytics capability calls for a new way of thinking about data. In particular, **IT must move from a reporting mindset to a true analysis mindset**—not just looking for patterns in a single data set, but comparing multiple data sets from IT management platforms and other tools, including data sources within individual business units, to identify correlations and relationships.

For example: a business unit has inadvertently scheduled a regional marketing program to peak at the same time the network is undergoing maintenance. With visibility into both areas, IT is able to predict that a degradation in customer experience for the company's new mobile app will increase customer service costs during this period, resulting in a lower gross margin for the promotion. Based on this insight, IT can work with the business to adjust their schedules to avoid this conflict and ensure the best results for customers and the marketing program.

1 Gartner, New CIO Responsibilities in a Digital Business World, John MacDorman & Dave Aron, 28 May 2015.

## Skills

This more-integrated approach to data analysis begins with an audit to discover what IT is now capable of measuring. What sources of existing data in the infrastructure, including both traditional structured metrics and unstructured formats such as help desk tickets and social media posts, can shed light on performance, customer experience, and usage? Collecting and unifying these diverse islands of data are critically important to build a more balanced picture of the operational environment.

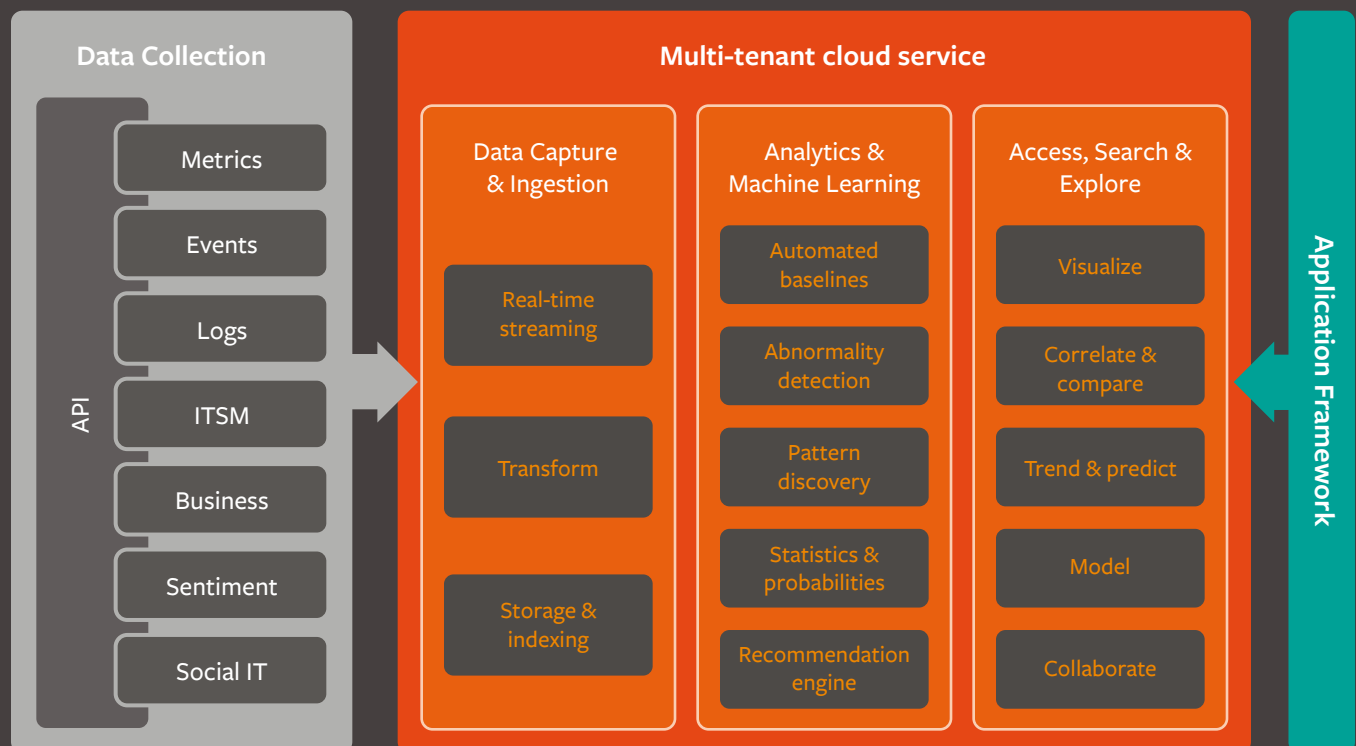
In addition to learning how to work with these less-familiar, unstructured data sources and formats, IT must come to terms with the unprecedented volume and velocity of data in the digital era. In the past, IT organizations often discarded data that failed to fit regular cycles or that moved too quickly to harness effectively. For a digital business, it's precisely this type of data that can prove most valuable, revealing fast-changing market dynamics, customer behavior, or demand trends.

## Tools

Existing IT toolsets are too specific to individual functions to provide a broader view into the environment. A mature analytics capability depends on a platform approach. As Gartner has reported, "... I&O teams' successful support of digital business initiatives requires a comprehensive, strategic [IT Operations Analytics] investment plan centered on a single, architected platform. This is done to apply distinct combinations of analytical techniques to all major IT operations disciplines, including service support and automation, not just those associated with availability and performance monitoring."<sup>2</sup> To be effective, this unified, integrated analytics platform must be built to enable real-time data streaming, transformation, storage, and indexing at enterprise scale.

As part of its audit of data sources, IT should evaluate its operations management tools already in place and the role their data can play in strategic analytics. Still, IT will need to contextualize the various data sources in light of the business goal and purpose using more-diverse data sources, and understand the relationships among separate data sources. This is only possible if the data sources are consolidated on a shared platform. **The commitment to this platform approach is an essential step in the journey to analytics maturity.**

## A Complete Platform for Mature Analytics



## Results

The result of this phase of the journey is the creation of a firm foundation for conversations with the business in a familiar language your peers in the business can understand, including the revenue, cost, and risk implications of technology. The ability to speak more holistically about data and its business purpose provides a context for true insight, and helps transform the perception of IT in the enterprise.

In this phase, IT is still exploring data sources by meeting with teams such as marketing, sales, production, and security to understand what they do, and how IT can better support them. It's a matter of asking questions about what's possible, not asking questions of the data itself. These conversations will become increasingly valuable as maturity progresses.

**Making the shift from a reporting mentality to a true analytics orientation is one of the most difficult parts of this journey, but it lays the groundwork for the transformational value to come in subsequent phases.**

## PHASE 2 – MACHINE LEARNING ALIGNED WITH DATA SCIENCE BEST PRACTICES

Once IT has begun thinking differently about data and its role in the business, and identified the diverse data sources available, it is in a position to apply machine learning to **extract business value from this data**. This will involve learning and embracing new best practices from data science, and as mentioned earlier, understanding that **90 percent of the effort in building a good analytics strategy lies in figuring out which questions to ask**.

## Skills

Machine learning can handle much of the heavy lifting of data analysis, but it isn't magic. It is a naïve assumption that simply pointing an analytics system at data sources throughout the enterprise will start generating incredible new insights without human intervention. The old saying, “garbage in, garbage out,” remains as true as ever. Machine learning tools need to know where to look for patterns, and what kinds of patterns will provide answers that are meaningful to the business. These questions and answers will often revolve around the most fundamental business issues. As Gartner explains, “For most business executives, three elements are fundamental metrics of success: revenue impact, cost reduction, and risk mitigation.”<sup>3</sup>

Accordingly, **IT must now develop a new skill set around question design**, a fundamental element of true analytics. Machine learning technologies also need to be trained on large samples of appropriate data—something IT will need to account for when preparing to embrace this approach. It's easy to underestimate the effort required for this, but it's essential for gaining actionable insight—not just regurgitating what a report says about system behavior, but explaining what it means to the business.

As in the first phase of the journey, established best practices from data science must inform this process. In the first phase, IT evaluated enterprise data sources using the thought processes of data scientists. Now, IT must approach problems the way a data scientist would. Ordinarily, IT teams don't spend much time thinking about questions; they see what kinds of information a system can provide, choose a few metrics to run each day or display within a dashboard, and keep an eye out for signs of trouble. Acting as a data scientist, the IT analyst will now begin by designing questions based on the data sources that best map to the answers most meaningful to the business. Fortunately, learning to approach problems like a data scientist doesn't have to involve a doctorate. According to Gartner, through 2017, **the number of citizen data scientists will grow five times faster than the number of highly skilled data scientists**.<sup>4</sup> Anyone with a grasp of technology can come up to speed on data science quickly, for free or at a low cost, by taking advantage of courses available on massive online open courses (MOOCs) such as Coursera.

## Tools

In this phase of the journey, the analytics platform continues to function as an engine to automate baselines and abnormality detection, but can also go further and look for patterns, statistics, and probabilities, and make recommendations. This makes it possible for IT to **shift from passive traditional analysis to a predictive, forward-looking capability**. Again, though, the information provided by the tool will be only as good as the thought that went into the questions it has been asked. **The IT organization's evolution to a data science mindset is essential for realizing greater value from the platform.**

3 Gartner, Map Infrastructure and Operations Metrics to Business Value, Robert Naegle & Jeffrey M. Brooks, 05 March 2015.

4 Gartner, Smart Data Discovery Will Enable a New Class of Citizen Data Scientist, Rita L. Sallam & Josh Parenteau, 29 June 2015.



## Results

This phase can create both excitement and disillusionment for IT operations. If IT has built its analytics foundation in the right way and developed the right skills, the team will already be gaining new context to understand the relationships between data and the business. More importantly, IT will gain a heightened awareness of how much more information and insight will soon be available, and how important it will be for the business. At the same time, though, IT is still a step away from full analytical enlightenment. This delay can lead to impatience or disillusionment. It's vital for leaders to maintain their commitment to complete the transition to full analytics maturity, at which point **data can act as a hypothesis generator for the business** and provide a continuous stream of insight to drive real value for the organization.

## PHASE 3 – ACCESS, SEARCH, EXPLORE

In the culmination of the analytics maturity journey, IT can **tap into unprecedented insight and understanding** of the operational environment and its relationship to business services. Things that were always assumed to be true turn out to be illusory, while other unsuspected realities come to light. For example, IT may learn that customers who interact with traditional customer service after a poor experience with a mobile app checkout process are less likely to re-engage with the company, but that customers whose issues are resolved via social media are five times more likely to recommend the company and three times more likely to buy more. Based on this insight, the company could then build out its social media capabilities and work to steer customers in this direction to resolve any issues they might have.

**IT also gains the ability to hold a true dialogue with business leaders in their own language**, entering seamlessly into discussions at the highest level of the organization to guide decision-making backed by clearly relevant and meaningful data.

## Skills

Having built the foundation for a mature analytics capability, IT leaders must now cultivate a new mindset throughout the enterprise: look to data before making decisions—not just operational decisions, but core strategic direction. This shift can be profound, especially for organizations accustomed to operating based on tribal knowledge or hunches, although most successful and progressive companies have already begun to adopt this discipline. As Big Data transforms industries, every business now faces data-driven competitors that make decisions about investment, staffing, product strategy, market strategy, and more based on real-world insight derived through data analysis.

## Tools

In this phase, the analytics platform can generate powerful visualizations, correlations, and comparisons to enable experimentation with data. IT can examine trends, make predictions, and drill deeper to follow clues and develop theories. People can build models based on new hypotheses, then share them to gain additional perspectives. The power and reach of the platform encourage further exploration, always tied closely to relevant business concerns by the discipline of data science.

## Results

Having completed the journey to analytics maturity, the IT organization can transform from a supporting appendage to a core part of the business, providing data-driven perspectives that are indispensable to informed decisions. The business impact can be dramatic. It can be seen when digital enterprises use data to disrupt even the most established and mature industries: using dynamic pricing to capitalize on real-time demand fluctuations, making investment decisions designed to optimize ROI, or shifting policy in response to emerging customer or competitor behaviors. From speaking only the language of lights, specs, and metrics, IT leaders have advanced to discussing revenue, costs, and risk on equal terms with business executives—with the advantage of data-based insight that only IT can deliver.

**Thanks to digital, CIOs have an unprecedented opportunity to transform themselves and their departments, and become a key voice at the executive table and boardroom.<sup>5</sup>**

## CONCLUSION

The analytics maturity journey must be undertaken by every IT organization that aims to remain relevant to the business and enhance its strategic value. While most IT groups already use analytics in a limited—though highly valuable—capacity to support high performance and availability, the digital enterprise era calls for a **more mature, forward-looking approach**. By analyzing data of all types, from all parts of the organization, with a data science mindset, IT can uncover new opportunities for business competitiveness and growth. In addition, IT can equip the business to evaluate every decision in terms of its predicted impact on **revenue, costs, and risks—not just gut instincts**.

While acquiring a more strategic analytics capability represents a significant change and a potentially daunting prospect for IT, the process can be broken down into three phases, each with its own implications for IT skills, tools, and results. By working step by step through the introduction of integrated data capture and ingestion, machine learning aligned with data science best practices, and rich functionality to access, search, and explore data, **IT can achieve its analytics goals and establish a new data-driven culture within its organization and throughout the enterprise**.

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### FOR MORE INFORMATION

To learn more about the analytics maturity journey, visit [bmc.com/analytics](http://bmc.com/analytics)

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