# Big Data:

Examples and Guidelines for the Enterprise Decision Maker
November 2016

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# Executive Summary

Despite the hype, Big Data is more than just a buzzword. Big Data is enabling organizations to create new products, to outpace their competitors and to save tens of millions of dollars. In this paper, we begin with a description of Big Data and the data management landscape.

Next, we describe examples of customers innovating with Big Data using MongoDB, the leading modern database platform, which has been a catalyst of the Big Data movement. With Big Data, these organizations:

1. **Build new applications that were not possible before,** like the City of Chicago, which uses MongoDB to cut crime with real-time data aggregation and analysis.
2. **Adapt and develop competitive advantages,** like a global telco that runs an online streaming video service on MongoDB to compete with over-the-top (OTT) competitors like Netflix and Amazon.
3. **Make customers happy,** like a top 5 insurance company that improves customer service by generating a 360-degree view of over 100 million customers using MongoDB.
4. **Reduce costs,** like a Tier 1 bank that saves tens of millions of dollars and meets new compliance standards by replacing legacy data infrastructure with MongoDB.

Big Data is enabling organizations to create new products, to outpace their competitors and to save tens of millions of dollars.

Given the nascent state of the market, we provide guidance to organizations selecting technologies for their Big Data projects.

Decision makers should consider the following dimensions:

1. **Online vs. Offline Big Data.** Do you need a product for an online, operational application or an offline, interactive and batch analytics application?
2. **Software Licensing Models.** How do you pay for the product?
3. **Community.** Who uses and supports the product?

4. **Developer Appeal.** Can your developers be productive with the product?
5. **Agility.** Is it easy to get started quickly, to adapt and to grow with the product?
6. **General Purpose vs. Niche Solutions.** Does the product solve one niche problem or many problems for your organization?

Finally we will explore how organizations are harnessing the power of Hadoop and Spark with MongoDB to create complete big data applications.

# Introduction

## Big Data Landscape

Over the past decade, major web companies like Google, Amazon and Facebook pioneered businesses built on monetizing massive data volumes. In the process, they invented new paradigms not only for extracting value from data, but also for managing data and compute resources - from data center design, to hardware, to software, to application provisioning. In the same way that the mission to the moon spawned a wave of innovation across multiple industries, Big Data has pushed information technology a quantum leap forward.

For organizations of all sizes, data management has shifted from an important competency to a critical differentiator that can determine market winners and has-beens. Fortune 1000 companies and government bodies are starting to benefit from the innovations of the web pioneers. These organizations are defining new initiatives and reevaluating existing strategies to examine how they can transform their businesses using Big Data. In the process, they are learning that Big Data is not a single technology, technique or initiative. Rather, it is a practice applied across many areas of business and technology.

## Defining Big Data

Big Data refers to technologies and initiatives that involve data that is too diverse, fast-changing or massive for conventional technologies, skills and infrastructure to address efficiently. Said differently, the volume, velocity or variety of data is too great.

### By enabling new types of applications and features, Big Data helps organizations generate new revenue streams and achieve strategic goals.

But today, new technologies make it possible to realize value from Big Data. For example, retailers can track user web clicks and location data to identify behavioral trends that improve campaigns, pricing and stockage. Utilities can capture household energy usage levels to better distribute supply, and to incentivize more efficient energy consumption. Governments and even Google can detect and track the emergence of disease outbreaks via social media signals. Industrial equipment manufacturers are storing and analysing sensor data collected from connected vehicles to determine preventive maintenance programs for fleet optimization, and for the monitoring of vehicle components for design enhancements. Banking institutions are capturing tick data and customer interactions to model risk and detect fraud.

# What Businesses Are Doing with Big Data

It can be hard to talk about Big Data in concrete terms. In this section, we briefly tell the stories of over a dozen organizations and four ways in which Big Data is changing their businesses. With Big Data, these organizations:

1. Build new applications that were not possible before
2. Adapt and develop competitive advantages
3. Improve customer satisfaction
4. Reduce costs

**Analyzing Geospatial Data:** The City of Chicago is using MongoDB to cut crime and improve municipal services.

## 1. Build New Applications That Were Not Possible Before

By enabling new types of applications and features, Big Data helps organizations generate new revenue streams and achieve strategic goals.

A global telco built a next-generation Internet of Things (IoT) platform using MongoDB, generating new revenue streams and taking a leading position in a nascent market. As consumer wireless and fixed growth slows in most mature markets, telcos are looking to alternative sources of growth. One highly promising area is IoT communication, a type of service in which devices and connected assets (e.g., sensors, meters, vehicles) capture events (e.g., temperature, inventory level, location), which are relayed over a network (wireless, wired or hybrid) to applications or other devices, which then automatically translate the captured events into meaningful information (e.g., items need to be restocked, vehicle needs to be serviced). But telcos and software vendors have failed to capitalize on this opportunity given the complexity of ingesting, managing and analyzing data from large numbers of sensors in real-time. With MongoDB, this telco is offering an industry-leading service that can take in up to 10 billion sensor readings for a single customer and can scale reliably as the business grows.

The City of Chicago is using MongoDB to cut crime and improve municipal services by collecting and analyzing geospatial data in real-time from over 30 different departments. For instance, in a given area, it might evaluate the number of 911 calls and complaints, broken lights, stolen garbage cans, liquor permits and abandoned buildings, determining that an uptick in crime is more likely than usual. The city needs to marry structured and unstructured data, to do so at scale and to conduct in-place, online analysis. With legacy technologies, this would be challenging at best, infeasible at worst. MongoDB makes it possible.

Leading risk management company Prescient delivers real-time threat intelligence to corporate security stakeholders and individuals. It delivers concise, actionable recommendations to help travelers avoid danger and, if necessary, react smartly to it. Prescient Traveler ingests massive volumes of structured and unstructured data – social media, breaking news, RSS feeds, real-time weather and geological alerts, public safety bulletins, economic stability indicators, as well as regional crime, health and natural disaster statistics – and uses advanced analytic systems to evaluate, visualize and disseminate relevant safety information. Text sources are analyzed by sophisticated software that determines sentiment, then identifies facts and events worth reporting to subscribers based on a variety of criteria. The platform uses SAP HANA and Hadoop for complex analyses according to defined “escalation criteria.” Following these text and geospatial analyses, Prescient's threat-vulnerability correlation process is completed when user profiles and locations persisted in MongoDB are queried to determine if threats relate to a specific person or population, based on their physical location and personal attributes. Alerts can then be triggered to help the traveler move to safety.

A European mobile operator is using MongoDB to monetize underused legacy data from wireless towers. Like many telcos, this operator collects mounds of data on the locations of its customers. Rational network investment hinges on knowing which cell sites require more capacity, or where more cell sites are needed. This operator uses MongoDB to power a new service through which a business can push location-specific offers to the telco's subscribers in real-time when they are in the vicinity of that business. This provides a new revenue stream for the telco and brings its legacy systems to life.

In a matter of years, a social networking company grew to serve tens of millions of users and over a million businesses. Using MongoDB, it started small and was able to scale the infrastructure to support the growth in user base and user activity. Doing so with legacy technologies would have been operationally challenging (even infeasible) and financially taxing. For this company, the Big Data problem was core to the company's business, and being able to scale reliably and predictably meant the difference between success and failure.

A top industrial equipment manufacturer is using MongoDB to power a cloud-based analytics platform that

ingests, stores and analyzes readings (e.g., temperature, location) from its customers' equipment. It then presents the readings back to customers via a web interface - including visualization, key metrics and time series analysis - to help them make better decisions about their businesses, such as where to provision equipment and how to increase facility efficiency. This company is the first to offer a service of this kind. It stands out in an industry that has seen little innovation in the last half century and can drive new revenue streams from its new application.

## 2. Adapt And Develop Competitive Advantages

Governments pass new regulations. Disruptive technologies challenge business models. Customers and employees make new demands. Big Data is helping organizations stay nimble so that they can adapt to these changes and develop competitive advantages.

Today's consumer prefers to use mobile for a growing number of activities. One of the largest Human Capital Management (HCM) solution providers saw this, and responded by building iPhone and Android mobile apps on MongoDB. MongoDB enabled the provider to pull a variety of data from myriad sources to create a single view of services - such as payroll, benefits and company policies - and to bring a mobile app to market within 3 months. This HCM provider adapted to its users' preferences and offers a service that differentiates it from a host of competitors still shipping legacy, on-premise solutions.

Telcos and cable providers have long been under attack from over-the-top (OTT) app and content providers like Netflix, Amazon and Apple. While the infrastructure providers expected to monetize their networks by offering their own content and value-added services, these OTT entrants have challenged that business model and have garnered significant traction. While many struggle to adapt, one telco has responded by creating its own OTT video service to compete with Netflix. The project entails storing, managing and serving thousands of titles and even more associated metadata in various formats. The company is using MongoDB because of its ability to handle the volume and variety of data involved; because it can perform in-place analysis to offer real-time recommendations; and because it substantially accelerates time-to-market, a crucial factor in the race to compete for new subscribers.

A leading consumer electronics (CE) vendor observed the rise of cloud-based syncing technologies like Dropbox, and set out to build an integrated consumer cloud service on MongoDB. As the race for CE market share rages on and the industry becomes increasingly commoditized, vendors are trying to develop value-added services that help them stand out from the pack and increase the stickiness of their products. This vendor adapted to major market developments - namely, increasing competition and consumer desire for cloud-based syncing services - helping it remain competitive in the tight race for consumer spend.

Vendors are trying to develop value-added services that help them stand out from the pack and increase the stickiness of their products.

## 3. Improve Customer Satisfaction

Big data can help increase customer satisfaction - which can reduce churn and increase revenue - by opening up access to information and by empowering customers.

MetLife has over 100 million customers and over 100 different products. Its back-office systems comprise a patchwork of siloed technologies that make it challenging for customers and representatives to access the right information. Using MongoDB, this company built an application that provides a single view of the customer, aggregating customer and product information from over 70 existing systems and making it available to customers and representatives. And it built the application in just three months. As a result, the provider decreases the time to resolve customer issues, making its customers happy; and it provides representatives opportunities to cross-sell and upsell using real-time analytics.

Telcos also manage a variety of OSS/BSS systems and offer hundreds of products across wireless and wireline, prepaid and postpaid, consumer and enterprise businesses. A major wireless operator built a unified Subscriber Identity Management system on MongoDB to increase customer satisfaction and to reduce churn, a key metric for telcos. This system improves call center efficiency by reducing the amount of time customer service representatives need to pull data on customers. MongoDB's support for real-time analytics enables a live dashboard that shows trending customer service issues, which can also help customer service representatives determine whether a customer complaint is an isolated issue or part of a larger pattern.

A leading newspaper increases user engagement and ad revenue by serving custom content and interactive features to over 20 million readers. As the media company has evolved from a traditional publishing business model, it has determined that user engagement is directly correlated with revenue: the more content users interact with, the higher the revenue. Legacy technologies were incapable of supporting the number of users, variety of metadata and real-time requirements for what it wanted to build. Using MongoDB, it is now able to deliver relevant content and interactive features to users more quickly, driving more revenue.

### 4. Reduce Costs

In many cases, Big Data projects emerge from existing applications that have not been able to cope with the growing volume, variety and velocity of data. Additionally, legacy technologies are burdened not only by limited capabilities and poor scalability, they also bring with them higher costs and legacy business models. Many organizations are pursuing Big Data projects that solve old problems with new solutions and help them reduce costs. Cost reductions are typically driven by decreased development effort using developer-friendly technologies, cost-efficient software and commodity hardware.

A Tier 1 bank is saving $40 million over 5 years by migrating its reference data management application to MongoDB. The application previously ran on a proprietary relational database. Not only did this database carry high license costs and expensive hardware requirements, but it also could not handle the availability and replication requirements that the business demanded. It would take 24 to 36 hours for the data to replicate across 12 global data centers, which meant international locations had out-of-date information. This cost this bank a number of fines for failing to meet regulatory requirements. With MongoDB, that data is now replicated globally in minutes. Through the project, this bank decreased development time, increased availability and realized substantial cost savings. Additionally, by migrating away from a license-heavy software model, the bank was able to shift a major portion of expenses from CapEx to OpEx.

Shutterfly, one of the largest photo-sharing websites globally reduced costs by 80% using MongoDB. The website safeguards more than six billion images for millions of customers. As the only photo-sharing site that does not down-sample, compress or force delete photos, it faced massive data growth that pushed the performance and budgetary limits of its existing relational database. Switching to MongoDB not only saved the company 80% in costs (CapEx and OpEx), but as a result of its migration the company also realized a 9x performance improvement.

A global company in the travel industry is reducing infrastructure costs by orders of magnitude using MongoDB. It captures hundreds of millions of data points from web, mobile and social platforms, then analyzes them to enhance customer experience and to drive additional revenue. Using a legacy database required the company to buy expensive hardware and storage solutions, but with MongoDB, it can use commodity, scale-out hardware that yields massive cost savings. Additionally, MongoDB's built-in high availability and data replication allows the company to reduce backup and disaster recovery costs.

## Considerations for Decision Makers

While many Big Data technologies are mature enough to be used for mission-critical, production use cases, it is still nascent in some regards. Accordingly, the way forward is not always clear. As organizations develop Big Data strategies, there are a number of dimensions to consider when selecting technology partners, including:

1. Online vs. Offline Big Data

**ONLINE VS. OFFLINE BIG DATA:** Online Big Data is created, ingested, transformed, managed and/or analyzed in real-time to support operational applications and their users. Offline Big Data encompasses applications that ingest, transform, manage and/or analyze data in a batch or interactive context; they typically do not create new data.

2. Software Licensing Models
3. Community
4. Developer Appeal
5. Agility
6. General Purpose vs. Niche Solutions

## 1. Online Vs. Offline Big Data

Big Data can take both online and offline forms. Online Big Data refers to data that is created, ingested, transformed, managed and/or analyzed in real-time to support operational applications and their users. Big Data is born online. Latency for these applications must be very low and availability must be high in order to meet SLAs and user expectations for modern application performance. This includes a vast array of applications, from serving content and product catalogs from a web site, real-time analytics of sensor data, personalizing user experiences in eCommerce applications to complex customer service applications. Examples of online Big Data applications include MongoDB and NoSQL databases.

Offline Big Data encompasses applications that ingest, transform, manage and/or analyze data in a batch or interactive processing. In this context, interactive is defined as queries that are returned with 10 second to 10 minute response times. They typically do not create new data. Since they usually produce a static (vs. operational) output, such as a machine learning model or report, they can even go offline temporarily without impacting the overall goal or end product. Examples of offline Big Data applications include Spark or Hadoop-based workloads; modern data warehouses; extract, transform, load (ETL) applications; and business intelligence tools.

Organizations evaluating which Big Data technologies to adopt should consider how they intend to use their data. For those looking to build applications that support real-time, operational use cases, they will need an operational database like MongoDB. For those that need a place to conduct long-running analysis offline, perhaps to inform decision-making processes, offline solutions like Spark and Hadoop can be an effective tool.

Big data technologies are not mutually exclusive. For example, many organizations are harnessing the power of Hadoop and Spark with MongoDB to create complete big data applications:

- MongoDB powers the online, real time operational application, serving business processes and end-users, exposing analytics models created by Hadoop and Spark to operational processes
- Hadoop and Spark consume data from MongoDB, blending it with data from other sources to generate sophisticated analytics and machine learning models. Results are loaded back to MongoDB to serve smarter and contextually-aware operational processes – i.e., delivering more relevant offers, faster identification of fraud, better prediction of failure rates from manufacturing processes.

A major web company, for instance, uses MongoDB and Hadoop together for user data management and analysis. MongoDB is the operational data store, storing and tracking rich user data (i.e., not just login information, but also online behavior). Additionally, it performs real-time analytics to dictate automated machine behavior. By contrast, the company uses Hadoop to perform more complex analysis offline. It pipes the data from MongoDB into Hadoop, where it groups user sessions, segments users by behavior and performs regression analyses to determine correlation and improve predictive models. Finally, it pipes the enriched data back into MongoDB, which informs the aforementioned real-time analytics. Review the MongoDB and Hadoop section later for more detail.

An international banking group has been using Apache Spark and MongoDB to build sophisticated customer analytics. The applications extract and process data from multiple operational systems using Spark machine learning, SQL and streaming APIs, before loading analytics models

into MongoDB for consumption by the business groups. The developers were able to reduce over 100 lines of integration code to just a single line after moving from a custom driver to the MongoDB Connector for Apache Spark.

## 2. Software License Model

There are three general types of licenses for Big Data software technologies:

- **Proprietary.** The software product is owned and controlled by a software company. The source code is not available to licensees. Customers typically license the product through a perpetual license that entitles them to indefinite use, with annual maintenance fees for support and software upgrades. Examples of this model include databases from Oracle, IBM and Teradata.
- **Open-Technologies.** The software product and source code are freely available to use. Commercial vendors monetize the software product by selling subscriptions and adjacent products with value-added components, such as management tools and support services. Examples of this model include MongoDB (by MongoDB, Inc.) and multiple Hadoop distributions (by Cloudera, Hortonworks, MapR and others).
- **Cloud Service.** The service is hosted in a cloud-based environment outside of customers' data centers and delivered over the public Internet. The predominant business model is metered (i.e., pay-per-use) or subscription-based. Examples of this model include MongoDB Atlas, Google Cloud Dataproc, and Amazon Elastic MapReduce.

For many Fortune 1000 companies, regulations and internal policies around data privacy limit their ability to leverage cloud-based solutions. As a result, most Big Data initiatives have been driven with technologies deployed on-premise. Most of the Big Data pioneers are web companies that developed powerful software and hardware, which they opened up to the larger community. Accordingly, most of the software used for Big Data projects is open to the community. There are many advantages to open software, like MongoDB, including lower total cost of ownership, code and development transparency, ease of adoption and the ability to engage in a community of organizations collaborating to improve the project.

## 3. Community

In these still early days of Big Data, there is an opportunity to learn from others. Organizations should consider how many other initiatives are being pursued using the same technologies and with similar objectives. To understand a given technology's adoption, organizations should consider the following:

- The number of active users and demand for skills
- The prevalence of local, community-organized events
- The health and activity of online forums such as Google Groups and StackOverflow
- The availability of conferences, how frequently they occur and whether they are well-attended

The global MongoDB community is large and growing, with over 9 million downloads, hundreds of thousands of online education registrations, 100,000+ deployments and over 800 partners.

## 4. Developer Appeal

The market for Big Data talent is tight. The nation's top engineers and data scientists often flock to companies like Google and Facebook, which are known havens for the brightest minds and places where one will be exposed to leading edge technology. If enterprises want to compete for this talent, they have to offer more than money.

One of the reasons that MongoDB is the leading database for Big Data platforms is its appeal to developers, who find it easy and natural to use.

By offering developers the opportunity to work on tough problems, and by using a technology that has strong developer interest, a vibrant community, and an auspicious long-term future, organizations can attract the brightest minds. They can also increase

the pool of candidates by choosing technologies that are easy to learn and use - which are often the ones that appeal most to developers. Furthermore, technologies that have strong developer appeal tend to make for more productive teams who feel they are empowered by their tools rather than encumbered by poorly-designed, legacy technology. Productive developer teams reduce time to market for new initiatives and reduce development costs, as well.

### 5. Agility

Organizations should use Big Data products that enable them to be build new applications and services quickly. They will benefit from technologies that get out of the way and allow teams to focus on what they can do with their data, rather than how to deploy new applications and infrastructure. This will make it easy to explore a variety of paths and hypotheses for extracting value from the data and to iterate quickly in response to changing business needs.

In this context, agility comprises three primary components:

- **Ease of Use.** A technology that is easy for developers and operations teams to learn and understand – either because of the way it's architected, the availability of tools and information, or both – will enable teams to get Big Data projects started and to realize value quickly. Technologies with steep learning curves and fewer resources to support education will make for a longer road to project execution.
- **Technological Flexibility.** The product should make it relatively easy to change requirements on the fly – such as how data is modeled, which data is used, where data is pulled from and how it gets processed – as teams develop new findings and adapt to internal and external needs. Dynamic data models (also known as schemas) and scalability are capabilities to seek out.
- **Licensing Freedom.** Open technologies are typically easier to adopt, as teams can get started quickly with free community versions of the software. They are also usually easier to scale from a licensing standpoint, as teams can buy more licenses as requirements increase. By contrast, in many cases proprietary software vendors require large, upfront license purchases, which make it harder for teams to get moving quickly and to scale in the future.

MongoDB's ease of use, automated operational tooling, dynamic data model and licensing model make it the most agile Big Data solution available.

### 6. General Purpose Vs. Niche Solutions

Organizations are constantly trying to standardize on fewer technologies to reduce complexity, to improve their competency in the selected tools and to make their vendor relationships more productive. Organizations should consider whether adopting a Big Data technology helps them address a single initiative or many initiatives. If the technology is general purpose, the expertise, infrastructure, skills, integrations and other investments of the initial project can be amortized across many projects. Organizations may find that a niche technology may be a better fit for a single project, but that a more general purpose tool is the better option for the organization as a whole.

For this reason, Fortune 500 companies are standardizing on MongoDB, a general purpose database, and deploying it on dozens of projects throughout their organizations.

## MongoDB with Hadoop or Spark

Hadoop is a software technology designed for storing and processing large volumes of data distributed across a cluster of commodity servers and commodity storage. Hadoop was initially inspired by papers published by Google outlining its approach to handling large volumes of data as it indexed the Web. With growing adoption across industry and government, Hadoop has rapidly evolved to become an adjunct to – and in some cases a replacement of – the traditional Enterprise Data Warehouse.

Rather than supporting real-time, operational applications that need to provide fine-grained access to subsets of

| | MongoDB | Hadoop or Spark |
|---|---|---|
| **eBay** | User data and metadata management for product catalog | User analysis for personalized search & recommendations |
| **China Eastern Airlines** | Data supporting flight search application | Calculate fares based on permutations of rules stored in MongoDB |
| **Orbitz** | Management of hotel data and pricing | Hotel segmentation to support building search facets |
| **Pearson** | Student identity and access control, content management of course materials | Student analytics to create adaptive learning programs |
| **Foursquare** | User data, check-ins, reviews, venue content management | User analysis, segmentation and personalization |
| **Tier 1 Investment Bank** | Tick data, quant analysis, distribution of reference data | Risk modeling, security and fraud detection |
| **Industrial Machinery Manufacturer** | Storage and real-time analytics of sensor data collected from connected vehicles | Preventive maintenance programs for fleet optimization. Monitoring of manufactured components in the field |
| **SFR** | Customer service applications accessed via online portals and call centers | Analysis of customer usage, devices & pricing to optimize plans |

**Table 1:** MongoDB powering big data applications with Hadoop and Spark

data, Hadoop lends itself to almost for any sort of computation that is very iterative, scanning TBs or PBs of data in a single operation, benefits from parallel processing, and is batch-oriented or interactive (i.e., 10 seconds and up response times). Organizations typically use Hadoop to generate complex analytics models or high volume data storage applications such as:

- Risk modeling
- Retrospective and predictive analytics
- Machine learning and pattern matching
- Customer segmentation and churn analysis
- ETL pipelines
- Active archives

Many organizations use Hadoop and MongoDB together to build complete big data applications. The MongoDB Connector for Hadoop Connector is a plug-in for Hadoop that provides the ability to use MongoDB as an input source and an output destination for MapReduce, HIVE and Pig jobs. The connector is certified by all of the leading Hadoop distributions including Cloudera, Hortonworks and MapR.

Whether improving customer service, supporting cross-sell and upsell, enhancing business efficiency or reducing risk, MongoDB and Hadoop provide the foundation to operationalize big data.

Learn more about MongoDB and Hadoop.

Apache Spark is one of the fastest-growing big data projects in the history of the Apache Software Foundation. Originally developed at UC Berkeley in 2009, Spark has seen rapid adoption by enterprises across a range of industries. With its memory-oriented architecture, flexible processing libraries and ease-of-use, Spark has emerged as a leading distributed computing framework for real-time analytics.

Spark is a general-purpose framework used for many types of data processing. Spark comes packaged with support for machine learning, interactive queries (SQL), statistical queries with R, graph processing, ETL, and streaming. For loading and storing data, Spark integrates with a number of storage and messaging systems including Amazon S3, Kafka, HDFS, RDBMSs, and MongoDB. Additionally, Spark supports a variety of popular development languages including Java, Python and Scala.

Written in Spark's native language, the Databricks-certified MongoDB Connector for Apache Spark provides a natural development experience for Spark users as they are quickly able to reuse existing Scala expertise. The connector exposes all of Spark's libraries, enabling MongoDB data to be materialized as DataFrames and Datasets for analysis with SQL, streaming, machine learning, and graph APIs.

Review the MongoDB Connector for Spark documentation to learn how to get started with the connector, and view code snippets for different APIs and libraries.

## Getting Started with Big Data and MongoDB

MongoDB, Inc. has worked closely with the community to create some of the largest, most innovative and successful MongoDB systems. For organizations beginning to develop big data strategies, the company offers a unique workshop to help business owners and technology management explore how to get started. These two-day events are delivered onsite and are facilitated by MongoDB experts. Staff will work with your teams to explore initiatives that will impact the business, what types of resources should be involved, example project plans, education strategies, infrastructure design and other best practices for Big Data and MongoDB.

## We Can Help

We are the MongoDB experts. Over 6,600 organizations rely on our commercial products. We offer software and services to make your life easier:

MongoDB Enterprise Advanced is the best way to run MongoDB in your data center. It's a finely-tuned package of advanced software, support, certifications, and other services designed for the way you do business.

MongoDB Atlas is a database as a service for MongoDB, letting you focus on apps instead of ops. With MongoDB Atlas, you only pay for what you use with a convenient hourly billing model. With the click of a button, you can scale up and down when you need to, with no downtime, full security, and high performance.

MongoDB Stitch is a serverless platform which accelerates application development with simple, secure access to data and services from the client – getting your apps to market faster while reducing operational costs and effort.

MongoDB Mobile (Beta) MongoDB Mobile lets you store data where you need it, from IoT, iOS, and Android mobile devices to your backend – using a single database and query language.

MongoDB Cloud Manager is a cloud-based tool that helps you manage MongoDB on your own infrastructure. With automated provisioning, fine-grained monitoring, and continuous backups, you get a full management suite that reduces operational overhead, while maintaining full control over your databases.

MongoDB Consulting packages get you to production faster, help you tune performance in production, help you scale, and free you up to focus on your next release.

MongoDB Training helps you become a MongoDB expert, from design to operating mission-critical systems at scale. Whether you're a developer, DBA, or architect, we can make you better at MongoDB.

## Resources

For more information, please visit mongodb.com or contact us at sales@mongodb.com.

Case Studies (mongodb.com/customers)
Presentations (mongodb.com/presentations)
Free Online Training (university.mongodb.com)
Webinars and Events (mongodb.com/events)
Documentation (docs.mongodb.com)
MongoDB Enterprise Download (mongodb.com/download)
MongoDB Atlas database as a service for MongoDB (mongodb.com/cloud)
MongoDB Stitch backend as a service (mongodb.com/cloud/stitch)

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