Quantifying Business Advantage

The Value of Database Selection
June 2016

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Introduction

In the digital economy, data is the raw currency. How an organization stores, manages, analyzes and uses data has a direct impact on its success. The organization's choice of database directly affects how quickly it can bring new applications to market, support business growth, improve customer experience and product quality, while enhancing business agility and reducing costs. Consider the following examples:

- **Enabling Business Innovation:** For eight years one of the world's leading insurance companies tried to better identify cross-sell and upsell opportunities and improve customer service by building a single 360-degree view of its customers. Following a change in assumptions on which database to use for the project, the project delivered a completely new application to the business in just three months.
- **Reducing Costs:** A Tier 1 investment bank rebuilt its globally distributed reference data platform on a new database technology, enabling it to save $40M over five years through reduced infrastructure and development costs, coupled with the elimination of regulatory penalties.
- **Accelerating Time to Market:** One of the world's leading telecommunications providers developed a new subscriber personalization service to improve customer experience and operational efficiency. After changing to a new database, the company was able to accelerate time to market by 4x, reduce engineering costs by 50% and storage requirements by 67%, all while achieving "orders of magnitude" higher performance.
- **Transforming the Customer Experience:** After migrating from its legacy relational database, the market leading personalized digital photo products and services company were able to improve the speed of their customers' online experience by 9x, reduce internal costs by 80% and slash the time of bringing new features to market from tens of months to weeks.
- **Enhancing Efficiency:** By selecting the right database to build its new trading platform, a leading European bank were able increase trader yields by 39% and application performance by 97.5% while reducing licensing costs by 74% and development time by 42%.

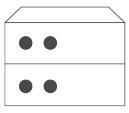
In this white paper, we will explore how organizations are realizing quantified business value by selecting MongoDB to power new generations of applications that were never previously possible and build software that transforms their business.

Realizing Business Vision with MongoDB

To understand how business value can be driven by the selection of a database, it is important to first consider how application and user requirements are evolving. Business and technology trends are changing the assumptions that have dictated database selection over the past 30 years.

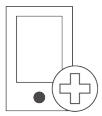
Unlocking Value From New Data

Applications now incorporate a wide variety of data, bringing structured, semi-structured and unstructured data together from today's mobile, social, cloud and sensor-enabled applications to deliver a seamless user experience and to yield deeper operational insight into all areas of the business. This diversity is a far cry from the simple general ledger and address book applications that helped to popularize the relational database. Organizations must embrace database technologies that provide the flexibility to model, store, process and analyze these new complex data types.



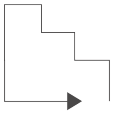
Growing Data Volumes Unleash New Business Insight

As of 2009, companies with more than 1,000 employees had at least 200 terabytes of stored data (twice the size of Wal-Mart's data warehouse in 1999). Many companies have at least 120 GB of data per employee. And business data volumes are doubling every 1.2 years. Organizations need to be able to seamlessly scale database capacity and performance to keep pace with data growth.



Business Innovation With New Types Of Applications

It is no longer sufficient for organizations to deliver run-of-the mill business process applications. Mobile, social and real-time analytical applications are not just potential differentiators — in many cases, they are now essential for remaining relevant. Trying to force-fit database technologies designed decades ago to support these new types of applications inhibits agility and drives up cost and complexity. Semi-structured and unstructured data does not lend itself to be stored and processed in the rigid row and column format imposed by relational databases, and cannot be fully harnessed for analytics if stored in BLOBS or flat files. It is critical to select a database that can not just store complex data, but also enables rich query and analytics capabilities in order to increase business visibility across a variety of data assets.



Windows Of Market Opportunity Are Getting Smaller

The waterfall approach to software development — which has dominated projects for decades — places enormous dependency on the requirements defined upfront. Today, organizations need flexible, iterative development practices to make it easy for teams to adjust plans in response to business and market evolutions. Requirements for data management change frequently, and the underlying database must be agile enough to accommodate these changes, without inhibiting developer productivity.

New Architectures Drive Down Cost, Drive Up Flexibility

The rise of commodity servers and storage, coupled with elastic, on-demand cloud computing has driven down infrastructure and operating costs. Traditional data management technologies, however, are not wellsuited to take advantages of these environments due to their monolithic scale-up design and assumption of consistent network and hardware quality-of-service. To fully

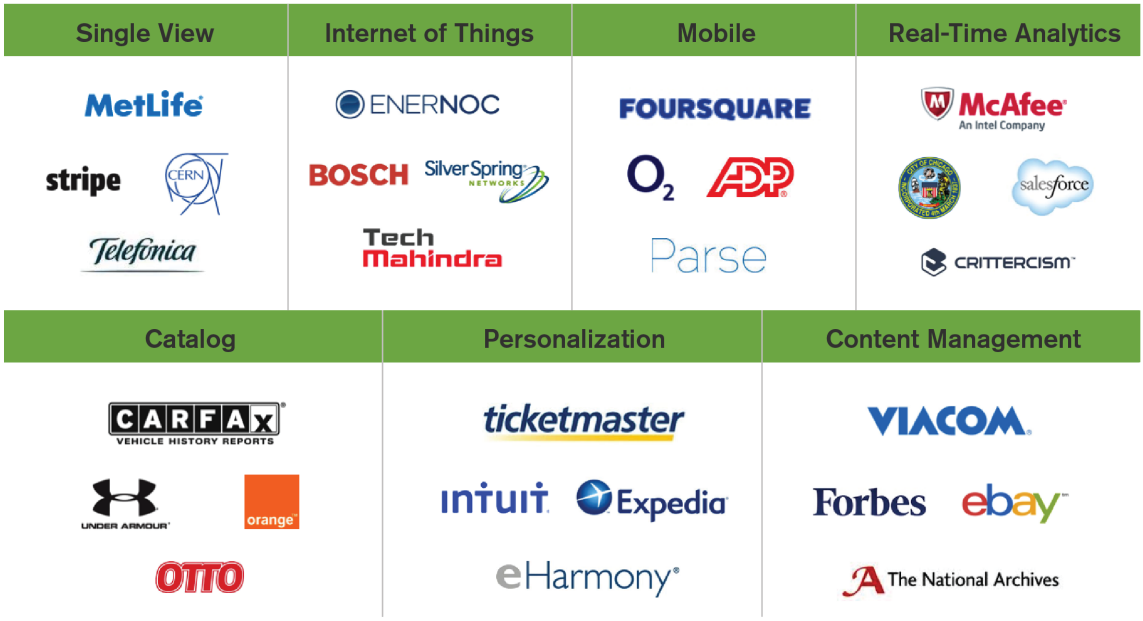


Figure 1: MongoDB Use Cases

exploit the economic advantages of commodity servers and cloud computing, the database must support horizontal scale-out deployments with in-built fault-tolerance to meet the SLAs demanded by the business.

Quantifying the Business Value of MongoDB

MongoDB enables engineers to build and manage modern applications quickly and easily. Organizations can move from pilot to production in weeks, not months.

As the fastest growing database for startups and leading organizations of all sizes, MongoDB has been downloaded over 30 million times and amassed 4,300+ customers, including more than a half of Fortune 100 companies. Significant customers include ADP, Bosch, Cisco, eBay, Expedia, MetLife, Telefonica, Ticketmaster and Verizon.

Among the Fortune 500 and Global 500, MongoDB serves:

- 40 of the Top Financial Services Institutions
- 15 of the Top Retailers
- 15 of the Top Telcos
- 15 of the Top Technology Companies
- 15 of the Top Healthcare Companies
- 10 of the Top Electronics Companies
- 10 of the Top Media and Entertainment Companies

Organizations around the world are realizing business value by building new services and refreshing existing applications with MongoDB. Benefits include the ability to build applications never before possible with faster time to market, improved customer service levels and reduced costs.

Gaining Competitive Advantage: Faster Time To Market

In today's global, hyper-connected economy, first mover advantage is critical. By using MongoDB:

- MetLife prototyped a new critical business application in two weeks, and deployed to production in just 90 days. It had been trying for 2 years to build the same application with a relational database.
- Telefonica achieved 4x faster time to market with 50% fewer developers, and increased speed of customer service by 10x.

- Genentech reduced the time to introduce new drug discovery tests from 6 months to 3 weeks.

MetLife — Delivering a 360 Degree Customer View

MetLife is one of the world's largest insurance companies. However, the data supporting its business was siloed, and they had tried different approaches over the years to bring it together. The goal was to streamline the experience for customers, to improve call center efficiency, and to create new cross-sell and upsell opportunities.

MetLife attempted a new initiative to deliver the project with a relational database, but after almost two years and millions of dollars of investment, it opted for MongoDB. Within two weeks the team demonstrated a prototype and after 90 days the application was in production. Key to success was MongoDB's flexible document data model and dynamic schema that allowed the aggregation of data from over 100 million customers, 100 products and over 70 source systems into a single data hub. Trying to achieve this single view in a relational model would have meant defining a common set of schema across a wide range of insurance products, something MetLife themselves said would have been nearly impossible to actually achieve.

> "Introducing technology like MongoDB to our development teams created a buzz and excitement that motivated and empowered teams to deliver work in months that would typically take years."
>
> — Gary Hoberman, CIO and Senior Vice President, Regional Application Development, MetLife

By partnering with MongoDB, MetLife has been able to liberate its data and reimagine the customer experience.

Using MongoDB Enterprise Advanced, Metlife has access to everything they need to run reliably at scale in production, including consultative support, disaster recovery and MongoDB Cloud Manager for proactive cluster monitoring and alerts. Learn more from press coverage of the project and the video interview.

Telefonica — 4x Faster Time to Market with 50% of the Developers

As one of the world's leading telecommunications companies, Telefonica constantly innovates in new applications and services. To accelerate the delivery of these services, they needed to consolidate customer data into a single repository.

Telefonica first used a relational database for the project. It took 20 technologists, 15 months, and 3 iterations before the team eventually turned to MongoDB. Standardizing across numerous schemas was taxing, and the relational database did not perform at scale.

Using the MongoDB Development Support to access consulting expertise and technical support, along with MongoDB University training to quickly ramp their developers and operations staff, the Telefonica team built a robust platform in 4 months, reduced latency by 10x and storage costs by 67% — with just half the development resource. Key advantages of MongoDB included agile development with its dynamic schema and native drivers, coupled with fault tolerance to ensure SLA compliance.

As well as delivering better products faster, Telefonica has been able to increase customer satisfaction, boost revenues and reduce costs. Learn more from Telefonica's presentation on their project.

Genentech

Genentech — Accelerating Drug Discovery: Months to Weeks

Genentech Research and Early Development (gRED) develops drugs to treat significant medical conditions. Its research saves lives. A critical component of this effort is the ability to provide researchers with new genetic strains so as to understand the cause of diseases and to test new drugs.

Using a relational database, the Genentech team needed to change the schema every time they introduced a new experiment, which delayed research by three to six months, and sometimes even longer. At the same time, the database was becoming more difficult to support and maintain.

MongoDB is at the heart of Genentech's initiative to accelerate drug discovery. MongoDB is able to capture the variety of data generated by genetic tests and integrate it with the existing Oracle RDBMS environment. MongoDB's flexible schema and ability to easily integrate with Oracle has helped Genentech reduce development from months to weeks or even days. In just one example, adding a new genetic test instrument had zero impact on the database schema and allowed Genentech to continue with research after just three weeks, instead of the standard three to six-month delay.

"Every day we can reduce the time it takes to introduce a new drug can have a big difference on our patients"

— Doug Garrett, Software Engineer, Genentech

Using MongoDB Enterprise Advanced, Genentech has been able to take full advantage of the rich query model and dynamic schema to support their agile R&D methodologies and fast time to market.

Learn more from Genentech's conference presentation

Forbes

Forbes — Just 4 Weeks for a Business Critical Mobile Application

Extending its content to a mobile audience was a priority for Forbes, the largest U.S-based business media brand. They had previously outsourced all mobile application development, but the need to gain greater insight into how readers were consuming and sharing content drove Forbes to bring development back in-house.

Using MongoDB, they were able to deliver the new mobile application in just 4 weeks. Key to this success was MongoDB's flexible document model and native drivers, coupled with training from the MongoDB University that accelerated the learning curve for developers, enabling them to rapidly innovate to exploit new channels and deliver business insight.

Forbes uses MongoDB Enterprise Advanced and Cloud Manager to monitor and support their production deployment.

View the video interview to learn more.

hike

Hike — Scaling to 15m Users in 9 Months

India's fastest growing messenger app is using MongoDB to manage its subscriber growth. MongoDB's natural development model enables Hike — a joint venture between Bharti and SoftBank — to add new features quickly and run real time analytics across a variety of applications, while providing the foundation to scale operations. "Our user base has sky-rocketed in the past couple of months and, with the surge in daily messaging volume, we knew we needed a partner who could meet our explosive growth," said Rajat Bansal, CTO, Hike messenger.

Hike's messaging platform uses MongoDB Enterprise Advanced for ensuring enterprise-grade capabilities, uptime and scalability to meet its demanding subscriber growth.

Read more in the press release.

Improving the Customer Experience: Taking Performance and Availability to New Levels

Customers are impatient. Making them wait costs loyalty and revenue. By using MongoDB:

- eHarmony is able to match potential partners 95% faster than their legacy system.
- Cisco reduces analytics latency from 30 seconds to just milliseconds.
- CARFAX is able to serve its customers 10x faster.
- Reverb application performance has improved by 20x, while reducing code by 75%.
- ADP is maintaining continuous service availability so its customers are never let down.

eHarmony — 95% Faster in Finding the Right Match

As one of the world's leading relationship service providers, eHarmony relies on its compatibility matching system to introduce singles to potential partners, relying on complex and comprehensive sets of a user's traits and preferences.

The process of identifying matches for the entire user pool was narrowed from 15 days using a relational database to 12 hours with MongoDB, a 95% reduction in time. This has resulted in

- 30% higher communication between prospective partners.
- 50% increase in paying subscribers.
- 60% increase in unique web site visits.

> "With our...SQL-based system, the entire user profile set was stored on each server, which impacted performance and impeded our ability to scale horizontally. MongoDB supports the scale that our business demands and allows us to generate matches in real-time."
>
> — Thod Nguyen, CTO, eHarmony

In addition to its rich query capabilities and flexible data model, eHarmony selected MongoDB for its built-in sharding and replication, and the ability to deploy new replica sets on demand.

A combination of MongoDB consulting and MongoDB Enterprise Advanced has enabled eHarmony to optimize application performance and maintain production SLAs.

Learn more from the Big Dating at eHarmony blog.

Cisco — Generating Real Time Business Insight from Social Enablement

Cisco is the worldwide leader in networking, transforming how people connect, communicate and collaborate. In November 2011, Cisco launched WebEx Social, an enterprise collaboration platform designed for the social, mobile and virtual workforce.

With their existing relational database, complex SQL queries against highly normalized schema were time consuming and Cisco had little room to scale horizontally. Additionally, it was difficult to manage schema upgrades as new features were added.

Cisco migrated to MongoDB to manage user activity feeds and run social networking analytics. Cisco were able to accelerate reads from 30 seconds in some extreme cases

to tens of milliseconds per object and eliminated caching in a number of cases.

Key to Cisco's success was MongoDB's intuitive and dynamic document model and schema, auto-sharding for scale-out and replica sets for high availability.

Read more in the case study.

CARFAX — 10x Higher Performance to Position for Business Growth

As one of the leading providers of vehicle history information, CARFAX helps millions of people buy and sell used cars with more confidence.

Originally building their vehicle history database on a Key-Value store, CARFAX started to hit limits in being able to cost-effectively scale their service as the business grew. CARFAX ended up selecting MongoDB to serve over 13 billion documents, delivering 10x higher performance, with the ability to replicate the database across data centers.

"Replacing our legacy database with MongoDB helps position us for future growth. MongoDB improves our ability to support continued customer demand and the growth of our vehicle history database."

— Joedy Lenz, CTO, CARFAX

CARFAX took advantage of MongoDB development support and MongoDB Enterprise Advanced to support every phase of their project, from design and architecture through to maintaining SLAs for their customer base.

You can learn more from CARFAX's senior systems architect and from the press release.

Reverb — 20x Higher Performance with 75% Less Code

Reverb Technologies is the world's largest English language resource – six times bigger than the Oxford English Dictionary.

Reverb Technologies was initially launched entirely on MySQL but quickly hit performance roadblocks. Adding too much data too quickly resulted in outages. After evaluation of multiple technologies, Reverb selected MongoDB, finding it offered the high performance and reliability the company required, coupled with a long runway for scale-out and high performance for data inserts and retrieval.

As a result of their migration, MongoDB has enabled Reverb to achieve 20x higher performance with 75% less code.

"Life with MongoDB has been good for Reverb Technologies. Our code is faster, more flexible and dramatically smaller. Since we don't spend time worrying about the database, we can spend more time writing code for our application."

— Tony Tam, Vice President of Engineering and Technical Co-founder, Reverb

Read the full case study to learn more.

ADP — Continuous Availability

Automatic Data Processing, Inc. (ADP), one of the world's leading human capital management and payroll outsourcing solutions provider, sought to extend HR data access to mobile employees and managers.

After extensive evaluation of multiple databases, ADP selected MongoDB as it was able to deliver the user experience modern consumers have come to expect. MongoDB's document model and dynamic schema made it fast for developers to build the application. High performance, scalability and reliability while also preserving the query and data manipulation capabilities of traditional relational databases were key for functionality and the customer experience.

MongoDB Enterprise Advanced helps maintain 100% production service availability, and with Cloud Manager, ADP was able to simplify operations.

You can learn more from ADP's presentation on the project.

Improving the Bottom Line: Growing Revenues, Reducing Costs

With the continued pressure on economic recovery, organizations are challenged like never before to both grow revenues by introducing compelling new products and services while at the same reducing costs through greater operational efficiency and exploiting commodity and cloud technologies. By using MongoDB:

- A Tier 1 investment bank is forecasting savings of $40m over the next 5 years.
- Shutterfly has reduced cost by 80% while improving customer service by 9x.
- AHL Man Group has reduced costs by 40x while improving speed of market data analysis by 25x
- Orange Digital has transitioned to the cloud and saved $2m.

Tier 1 Investment Bank

Tier 1 Investment Bank — Saving $40m, Shifting Capex to Opex

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 across four different continents 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.

Read more on this and other use-cases in the Big Data: Examples and Guidelines for the Enterprise Decision Maker white paper.

Shutterfly

80% Lower Cost, 9x Higher Performance

As the market leading personalized digital photo products company, Shutterfly faced massive data growth that pushed the performance limits of its existing Oracle database.

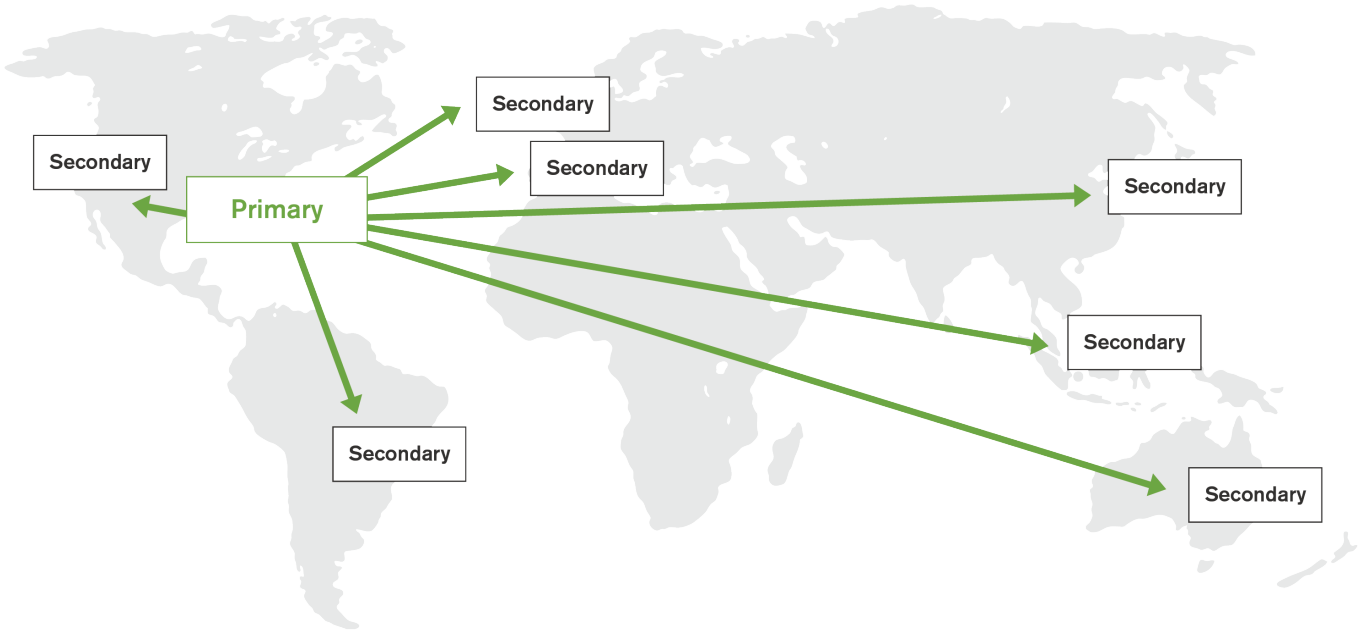


Figure 2: MongoDB Data Center-Aware Distribution, to Serve Global Audiences

After an extensive analysis of open source relational and non-relational alternatives, Shutterfly chose MongoDB as its new database, providing an agile, high performance, scalable solution at low cost.

MongoDB's document model enriched Shutterfly's data modeling abilities, allowing for new query patterns previously unavailable, while the flexible schema cut development cycles and accelerated time to market. By leaving behind its legacy code base, MongoDB has enabled average latency for inserts to drop to 2ms from 400ms.

Shutterfly's switch from Oracle to MongoDB has resulted in a 9x performance improvement and 80% cost reduction. Additionally, Shutterfly can now develop applications in a couple of sprints – a timeframe of weeks rather than tens of months.

Shutterfly uses Cloud Manager as the primary tool for gaining system visibility and insights. Not only has it saved on DBA resources but it also provides tight integration with the MongoDB support team who can speed resolution of any development or production issues.

Read the full story in the case study.

Man | AHL

AHL, a part of Man Group plc, is a quantitative investment manager based in London and Hong Kong, with over $11.3 billion in assets under management. The company relies on technology like MongoDB to gain a competitive edge in the systematic trading market.

AHL continually innovates to better support its quantitative researchers – or "quants" – in researching, constructing and deploying new trading models, in order to understand how markets behave. At the same time, AHL is continually exploring ways to reduce cost.

After evaluating multiple technology options, AHL replaced a range of traditional technologies including relational and specialised "tick" databases with a single platform built on MongoDB. AHL uses MongoDB for every type and frequency of financial market data, and for every level of data SLA.

MongoDB's flexible data model enables AHL to ingest and query data of any structure. Distributing data across clusters of commodity nodes allows AHL to reduce costs while improving performance. The results have been outstanding:

- Quants can retrieve data 100x faster with MongoDB
- Tick market data streams are processed at 25x throughput with a 16-shard cluster
- MongoDB has driven 40x reduction in costs

"Happy Quants. Happy Accountants"

— Gary Collier, Technology Manager, AHL MAN Group

Hear the full story in AHL's conference presentation.

Orange Digital — Bringing Cloud Economics to the Database

Orange Digital is a subsidiary of France Telecom, supplying digital services to EE (Everything Everywhere) in the UK and Orange across Europe. Orange Digital was previously running its services on a relational database using in-house servers. However, as the number of users grew and the range of services and content expanded, the company started to look for alternative combinations of hosting, database and application technologies that would be more stable, secure and scalable.

Orange Digital took the decision to move to Amazon Web Services and chose MongoDB primarily due to replication, auto sharding, failover and disaster recovery — features which are especially relevant in a cloud based infrastructure where hardware failures do happen.

"Quite frankly we were blown away by the performance of MongoDB. Between the move to Amazon and by opting for MongoDB, we've saved about £2m over the last three years in database and platform licenses and hardware."

— Neil Jennings, Lead Enterprise Architect, Orange Digital

The key to Orange Digital's success has been access to the MongoDB engineering team. "The best thing has been that, from the get-go, MongoDB's engineers have been very quick to help and have a developerfirst approach, giving helpful, professional advice."

Read the case study to learn more.

Conclusion

As all of the examples above illustrate, making the right choice of database can deliver quantified business results — whether measured in time to market, improved customer experience, enabling new types of applications, achieving higher revenues or reducing costs.

If your next project involves managing the scale and diversity of data in today's and tomorrow's applications, using modern languages and development methodologies, or running on the latest generations of commodity hardware on-premise or in the cloud, then you should evaluate MongoDB.

We Can Help

We are the MongoDB experts. Over 4,300 organizations rely on our commercial products, including startups and more than half of the Fortune 100. 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 backend as a service (BaaS), giving developers full access to MongoDB, declarative read/write controls, and integration with their choice of services.

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 Professional helps you manage your deployment and keep it running smoothly. It includes support from MongoDB engineers, as well as access to MongoDB Cloud Manager.

Development Support helps you get up and running quickly. It gives you a complete package of software and services for the early stages of your project.

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)
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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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