Solve Perpetual Manufacturing Challenges with Evolving Data

How adopting a cloud-first, data-driven approach will help your organization evolve with the future

Technological advances can sometimes manifest slower than we expect. For many manufacturers, that's been the case for the promises of Industry 4.0 and IIoT. You're likely sitting on valuable data troves — such as operational technology (OT) data from machines, sensors, computer vision, and human operators, and general business data like financials, orders, and customer records — that have proven difficult to harness and leverage to improve operations and margins.

Realizing the promise of Industry 4.0 is hard. Machines and workstations equipped with sensors generate extremely valuable information, but at a pace and quantity that feels nearly impossible to keep up with. The number of data sources and types continues to grow, outputting tremendous amounts of data that are challenging to collect, connect, and process in real-time. It's not surprising that many companies are struggling to develop and manage the database infrastructure and services necessary to harness this data so they can build smart factories that lead to improved business insights and decisions.

Manufacturers need a more user-friendly, flexible technology foundation that captures and analyzes different types of industry and business data, so you can build innovative applications that both address common production challenges and meet the specific needs of each factory. This database foundation should empower your IT and dev teams to flex and pivot when circumstances demand and stay ahead of competitors.

What types of applications can be created with such a foundation? Imagine being able to:

→ Reduce downtime and increase overall equipment effectiveness (OEE) through equipment and process data

→ Improve product quality through computer vision and tracking issues to specific sources (e.g., certain production shifts, machinery, or raw materials)

→ Automate raw material inventory management so that managers are alerted when stock levels are low and orders are placed automatically

→ Reduce manual production tracking for a more accurate view of productivity and more efficient use of shift supervisors' time

Whether you manage a single shop floor or multiple factories worldwide, it's time for manufacturers like you to benefit from the promise of IIoT and data-driven operations to build more resilient and leaner operations that can evolve with customer expectations and weather volatility.

Let's start with the challenges your dev teams are currently facing. Then, we'll discuss how cloud technology can put them — and your facilities — on an easier path to Industry 4.0 success.

The Difficulties of Data

First, let's take a step back to understand the complex data landscape. Today's factories produce an unfathomable amount of data points, far too much for humans to parse. These data sources are manifold, scattered, and continually increasing in number — from machinery, environmental controls, and fleet vehicles to the finance office, the warehouse, and even customer devices.

Further complicating matters, IIoT data is often on the edge, meaning it is generated and processed locally at the device level versus in your network. You may even have devices collecting data while in unconnected dead zones, which must later be reconciled.

North American factories with

500+ employees averaged

227 IoT devices in 2020.

**365** The number it's expected to increase to by 2025.[1]

Manufacturers that can provide an excellent digital customer experience around their products — as well as use technology to remove inefficiencies, waste, and quality issues in their processes — will realize an outsized competitive advantage.

To accomplish this, factory devs need every obstacle removed so they can build these apps quickly in a scalable and sustainable way. The first step in the right direction is providing them with a cloud-first developer data platform that can streamline how they build apps that collect and analyze data (both from the shop floor and customer devices) in real-time.

The Cloud Saves the Day

A cloud-first strategy reduces data management complexity, ensures availability and scale, and "evolution-proofs" your technology — all of which free your developers from the pains we just described so they can build apps that use all of this data to drive real bottom-line improvements.

A built-for-cloud managed database solution simplifies how data is collected, stored, and processed so that it's easier for devs to bring together data from different sources. The vendor manages everything beneath the hood, including data structures, infrastructure, and services, so that your developers can stop being waylaid by challenges like making data sources "talk" to one another, creating basic database services (like search), or ensuring databases are stable, secure, and available. They can solely focus on building great apps — and do it much faster than before.
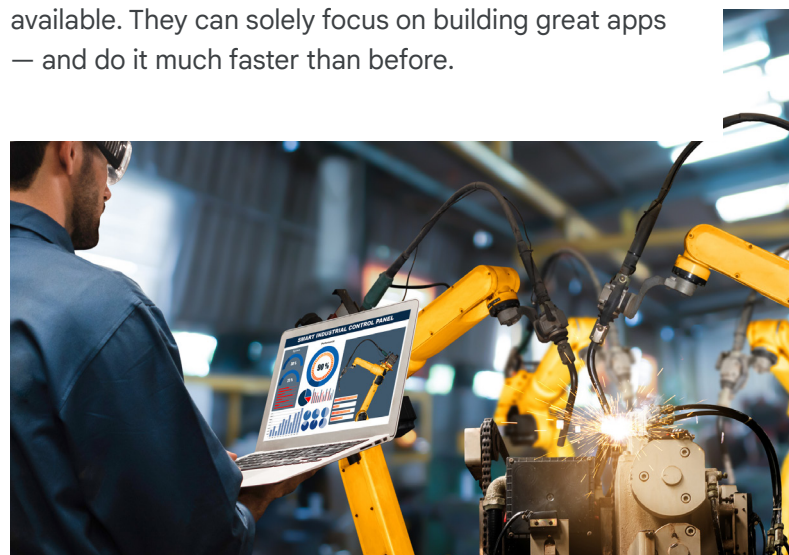
With a single cloud-based database management solution, you get superior:

➡️ **Scalability and power:** Collect and process massive amounts of data worldwide in real-time or near real-time, even with edge devices.

➡️ **Availability:** Enjoy reliable uptime vs. legacy tools that often require slow reboots and maintenance.

➡️ **Intelligence:** Act faster and with more confidence with AI/ML that finds patterns undetectable to humans and initiates appropriate alerts and actions.

➡️ **Accessibility:** Create apps that are available to staff anywhere and on any device.

➡️ **Efficiency:** Easily migrate data and enjoy rapid deployment. Once running, automate data backups, scaling, and other database maintenance work.

➡️ **Security:** Rest easy knowing your valuable trade and customer data is protected by enterprise-grade, zero-trust security.

➡️ **Innovation:** The right cloud ecosystem and database technology provider will continue to evolve with digital change, providing new tools and integrations that let developers focus on solving problems, not building infrastructure.

Data-Forward App Development with MongoDB and Google Cloud

To empower your manufacturing company to solve age-old problems like reducing costs, increasing production and OEE, decreasing waste, and minimizing quality issues, you need next-level technology. Building with [MongoDB Atlas on Google Cloud](#) gives you a launching pad for the apps you need today and a foundation to build the apps you'll need in the future as IIoT evolves.

While MongoDB Atlas accelerates and simplifies how your developers innovate with data, Google Cloud provides a globally available, highly scalable, tightly secured, and sustainable cloud base. Investing in the Google Cloud ecosystem opens your company to an expansive set of well-integrated services and vetted partner solutions, backed by the cleanest cloud available, 99.99% availability, massive elastic scalability, and state-of-the-art security — all with one unified bill for a unified set of services.

Equipped with both, your manufacturing facilities can benefit from smart, connected solutions that enable your teams to make quick, informed, and confident decisions.

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"[We needed] a solution that would not bow down to data size and one that makes your APIs perform better with millisecond time. On top of MongoDB Atlas, we currently have more than 50 data access services retrieving information from more than 50 collections and transmitting data to our front end at a rate of 21,000 transactions per second."
– Suryadeep Chatterjee, Senior Director of Enterprise Architecture, Integration & Automation Technologies, [American Tire Distributors (ATD)](#)

➡️ [Visit MongoDB Atlas](#) on the Google Cloud Marketplace to learn more.