Creating a Safer Workplace

Facilitating streamlined, mobile workplace inspections with a connected checklist application

Trusted by over 9,000 different organizations worldwide, SafetyCulture is helping improve the safety of workplace environments by changing how organizations conduct inspections. Launched in 2004 from CEO Luke Anear's garage, the Australian company helps organizations across the globe and in a wide variety of industries conduct more than 1.47 million inspections per month using the SafetyCulture iAuditor application.

To stay ahead of the competition and meet customers' changing requirements, the company relies on technologies that can help them deliver a responsive user experience and facilitate continuous innovation.

The Challenge: Support a fast-growing and evolving mobile-first application

"Our mission is to provide a mobile-first solution that puts safety in the hands of every worker," says Brett Porter, head of architecture at SafetyCulture. "With the iAuditor application, individuals can quickly and conveniently perform inspections from wherever they are. Teams can then synchronize, share, and analyze the results from a central place."

The application enables workers to collect a wider array of information with greater frequency than traditional paper-based methods. "Workers can use a smartphone to register responses to questions, get required signatures, and capture photos," says Porter. "They can collect all that information daily instead of quarterly. As a result, they can gain more timely insights and make improvements sooner."

iAuditor has been broadly adopted. "We've seen it used across virtually every industry," says Porter. "In addition to construction and logistics, organizations are using it in retail, hospitality, medicine, and more."

To accommodate the growing popularity of iAuditor, SafetyCulture needs a scalable data platform – one that can store and provide fast access to a rising volume of documents from a growing number of customers.

"As our customer base has grown, they have also found new ways to use SafetyCulture — which translates to a rapidly growing number of documents that we need to store," says Porter. "And it's more than just text – we see 1.69 million images added by customers per month. We need technologies that support our growth and allow us to continue to deliver seamless user experiences."

The data platform beneath the application must also be flexible. "Customer requirements are constantly changing," says Porter. "We need technologies that will let us introduce new application functionality quickly so we can address customer needs as we expand into new industries and environments."

SafetyCulture

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— Brett Porter
   Head of Architecture
   SafetyCulture

At the same time, SafetyCulture must protect the data it stores, including its public library of inspection templates, tailored templates created by customers, the audit data that users record, and other pieces of data that are relevant to inspections. "Customers depend on us to keep their data safe," says Kris Croaker, DevOps engineer at SafetyCulture. "We need the reliability and resiliency to ensure that we do not lose their valuable information."

The Solution: Implementing a foundation for today's – and tomorrow's – requirements with the Couchbase data platform

From the beginning, SafetyCulture has relied on NoSQL technology for its data platform. "For the type of documents that iAuditor processes, NoSQL makes the most sense," says Porter. "The templates and audits must be flexible. They change depending on how workers answer questions within the checklist. So, the documents expand to include additional items, and the data changes based on the responses given. NoSQL can handle that required level of flexibility better than traditional relational databases."

The SafetyCulture team selected Couchbase to serve as the primary data platform when the team was re-architecting its iAuditor application. "We were moving toward a microservices approach with Amazon Web Services, and Couchbase was the clear choice for a NoSQL data platform," says Porter.

SafetyCulture currently has six memory-optimized R3 nodes in Amazon Web Services, each with 61GB of memory. The company also runs Elasticsearch to index much of the content in that data store. To support offline sync for remote users in the field, the company uses Couchbase Lite, and Couchbase support for JSON documents helps to simplify development. "Couchbase is a natural fit with JavaScript-based development because a lot of the NoSQL content is stored in JSON," says Porter. "Developers have the tools they need to easily work with that content."

The Result: Delivering a responsive experience that is ready to scale

Scalability for continued growth

With Couchbase, SafetyCulture has the scalability to support an expanding customer base and a growing number of documents. "We currently store more than 17 million items, which equals approximately 560GB of data. But those numbers are increasing all the time," says Porter. "With Couchbase, we can easily adjust the size of the data store to accommodate a growing number of documents and rising amounts of traffic."

Expanding the data platform has been seamless. "When we've needed to migrate data or add nodes to the cluster, it's worked very well for us," says Porter.

Maintaining performance for a responsive experience

Couchbase caching capabilities provide the consistent, robust performance required to deliver a responsive user experience, even as the number of users and documents grows. "We need to achieve thousands of reads per second to support not only the audit data but also data used for authentication and user management. Much of that data is cached by Couchbase," says Porter. "The cache is extremely helpful in enabling us to achieve the level of reads per second we need. I don't think any other solution would have held up as well."

Sustaining availability

The SafetyCulture team has also been able to maintain the availability and resiliency that is critical for meeting customer service-level agreements (SLAs). "Couchbase has been a very reliable part of our stack," says Porter. "It has not been a cause of any issues regarding reliability in the two years we've been using it. We can just forget it's there."

To help make sure data stays available, the company employs Cross Datacenter Replication (XDCR), which can replicate data between two or more autonomous Couchbase clusters. "In the event of a loss to our primary cluster, we have an up-to-the-second replica of all our customer data," says Croaker. "We also use Couchbase Backup Manager for full daily backups."

Achieving the flexibility for evolving applications

Couchbase also facilitates innovation, enabling SafetyCulture to continuously adapt to changing customer needs. "Applications evolve very quickly," says Porter. "With Couchbase, we can add new capabilities to our iAuditor application without having to make large changes to the data platform. We can incorporate new types of items within the documents and adjust user preferences in the main system relatively easily."

Looking Ahead: Using Couchbase N1QL to develop new application capabilities

The Couchbase data platform's flexibility will enable the SafetyCulture team to continue to capitalize on new technologies, including N1QL (pronounced "nickel"). N1QL is a declarative query language that extends SQL to JSON documents. "One of our next products is going to make use of N1QL by migrating some of our older traffic onto N1QL," says Porter. "It gives us the tools to explore some interesting new application capabilities and use cases."

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About Couchbase

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