databricks

# Databricks
# Customer Story:
# StrongArm

STRONGARM TECH

"This is a massive problem that not only impacts the entire global supply chain of some of the biggest companies in the world, but it also affects the families of the workers in these warehouses who have so much more to lose."

**BRYANT EADON**
CIO at StrongArm Tech

# Creating a safer workplace with big data and machine learning

**StrongArm Tech combines talent across data teams with Databricks to reduce workplace injury rates by up to 54%**

Many industrial injuries don't happen overnight. They develop slowly, over long periods of repetitive harmful motion, ultimately leading to physical damage that can, in worst cases, be irreparable. StrongArm Tech is tackling this problem with wearable devices that track daily motion and activity as well as the wearer's immediate surroundings.

With Databricks, they are able to ingest massive amounts of real time IoT data for downstreaming machine learning that provides proprietary Safety Scores and classifications of activities to predict risk, resulting in a smarter, safer environment: StrongArm has been able to reduce industrial workplace injury rates by over half, and deliver millions in health and insurance cost savings for both their customers and their customers' employees.

## 54%
REDUCTION IN WORKPLACE INJURY RATES

## 78%
REDUCTION IN THE MARGIN OF ERROR FOR EVALUATING INJURY RISK

## $5.3M
IN GROSS ANNUAL SAVINGS

# The complexity of leveraging data to improve workplace safety

Industrial injury is a big problem that can have significant cost implications, not only for the employer but also for the employees who must bear the brunt of medical costs.

"Lower-back injuries are the most common types of injury in the industrial workspace. Every time a worker gets injured, it typically costs $65,000 in terms of medical expenses but that's just the start," explained Bryant Eadon, CIO at StrongArm. "Then you add additional costs like lost workdays, training replacements, insurance claims, and the increased risk of future injuries and all of a sudden your costs are spiraling out of control."



**StrongArm's goal is to capture every relevant data point to predict injuries and prevent these runaway costs from occurring. For context, the motion information StrongArm captures is sampled at every 80 milliseconds, or 12-and-a-half times a second, which translates to roughly 1.2 million data points per day, per person.**

Before discovering Databricks, StrongArm was storing their data across three disparate systems, which made it difficult — and sometimes impossible — to identify breaks in the entire process. For example, data engineers couldn't easily monitor and prep with data quality and integrity for downstream analytics. With such large volumes of time-series data flowing in real time, they struggled to build reliable and performant ETL pipelines that could scale to meet data science needs. Maintaining infrastructure also required significant resources, often taking an entire week to provision clusters that were stable enough to handle their workloads.

From a data science perspective, working from a single laptop proved to limit their ability to efficiently perform ad hoc queries and weren't able to train their models against their entire datasets. Analysts also struggled to make use of their data, limiting insights they needed to determine how to best innovate on current processes.

Across the various data teams, collaboration among both systems and personnel was challenging. Data professionals already struggle with collaboration as teams are often siloed, their jobs historically being less about cross-pollination and more about urgency, but without the right tools to foster the teamwork needed, it just exacerbated the situation. The StrongArm team knew that while they'd made great progress as a startup, the fact that taking a model from dev to production was so extraordinarily demanding meant they weren't fully realizing their goal. They needed to remove the complexities of data analytics so that they would shift their energy and focus on developing innovative solutions that would improve the lives of their Industrial Athletes.

# A unified data lake and streamlined machine learning lifecycle

StrongArm's interest in Databricks was initially piqued by the promise of data unification. Once deployed, it became the single source of truth for all of their data across systems and completely changed the game. Iteration and collaboration were no longer an issue as data engineering, data science and the analysts were able to more easily work on the data together. Upfront data engineering was also greatly improved. Databricks' fully managed platform on AWS as the provisioning of compute clusters became much easier, and what once took hours was doable in a few clicks.

Delta Lake solved their data reliability issues, allowing them to easily ingest real-time IOT data from various sources with ease. Matt MacNeille, a data engineer at StrongArm, added that Databricks has taken much of the burden from the data engineering team and allowed him to focus on higher-value activities. "All of the capabilities Databricks offers have made us better and faster," he said. "The notebooks feature gives us the ability to edit concurrently which has been huge across our data teams, and Delta Lake solves the problem of concurrent reads and writes and all the things that you need ACID transactions for."

With data pipelines flowing seamlessly to the data science team, the data science team was able to more easily innovate with machine learning. MLflow streamlined the entire machine learning lifecycle, automating tasks and allowing them to quickly track, version, and iterate on models to ensure the best models make it to production.

"Databricks has been immensely useful; MLflow in particular," said Siva Bommireddy, Data Scientist at StrongArm. "Beforehand, I had no way to structure my data science research project. If I had a model and iterated 20 times, I would forget what the results for my first model were, so I would have to dig through so much. MLflow makes that easier to manage, and solves for the iterative nature of data science in general."

The last group to benefit from the unification of data across the organization was the business and analyst team. Matt added that being able to produce results for non-technical teams has been incredibly fulfilling. "I can actually deliver results that make sense to all teams, data-specific or not, within 15 minutes," he said. "Databricks has solved so many data use cases."
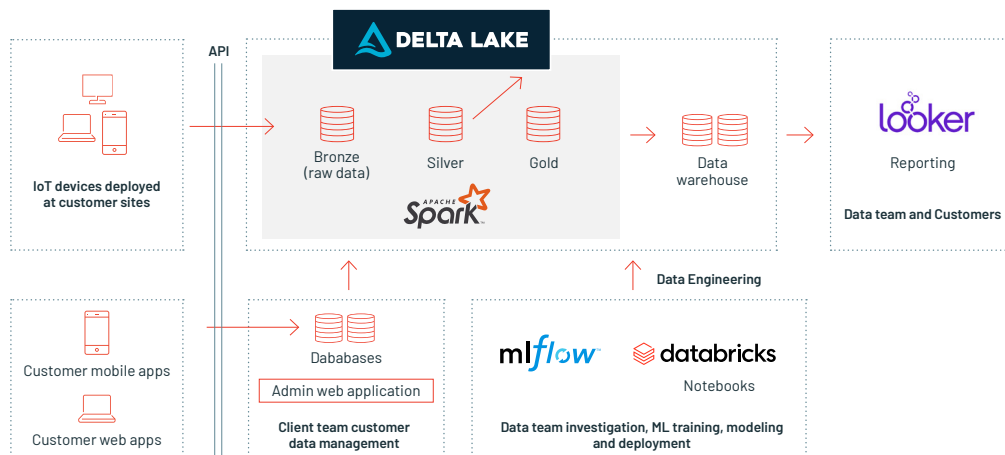


*Databricks unifies data engineering, data science and analytics*

# 54% reduction in injury resulting in over $5M in cost savings

With Databricks serving as the unified data analytics platform across their data organization, StrongArm is now able to solve their customers' most pressing challenges with machine learning and AI.

In StrongArm's case, unlocking insights from their sensor data translates into new strategies and processes their customers can employ to improve the workplace safety and the livelihoods of their employees. For example, their machine learning models enable wearable devices to sense when movement exceeds established safety parameters. If a given threshold is exceeded, it emits a vibration, called Haptic Feedback, that lets workers know that they are doing something that could potentially result in injury. Over time, this has positively changed the behavior of their customers' industrial workers.

And the impact on the bottom line has also been significant. After performing a deep dive analysis of one of their largest Fortune 100 customers, StrongArm measured a reduction of workplace injury by up to 54% and experienced estimated savings of 54% on injury costs, delivering a **355% ROI on $5,347,368 in gross savings**. At the same time, StrongArm has been able to
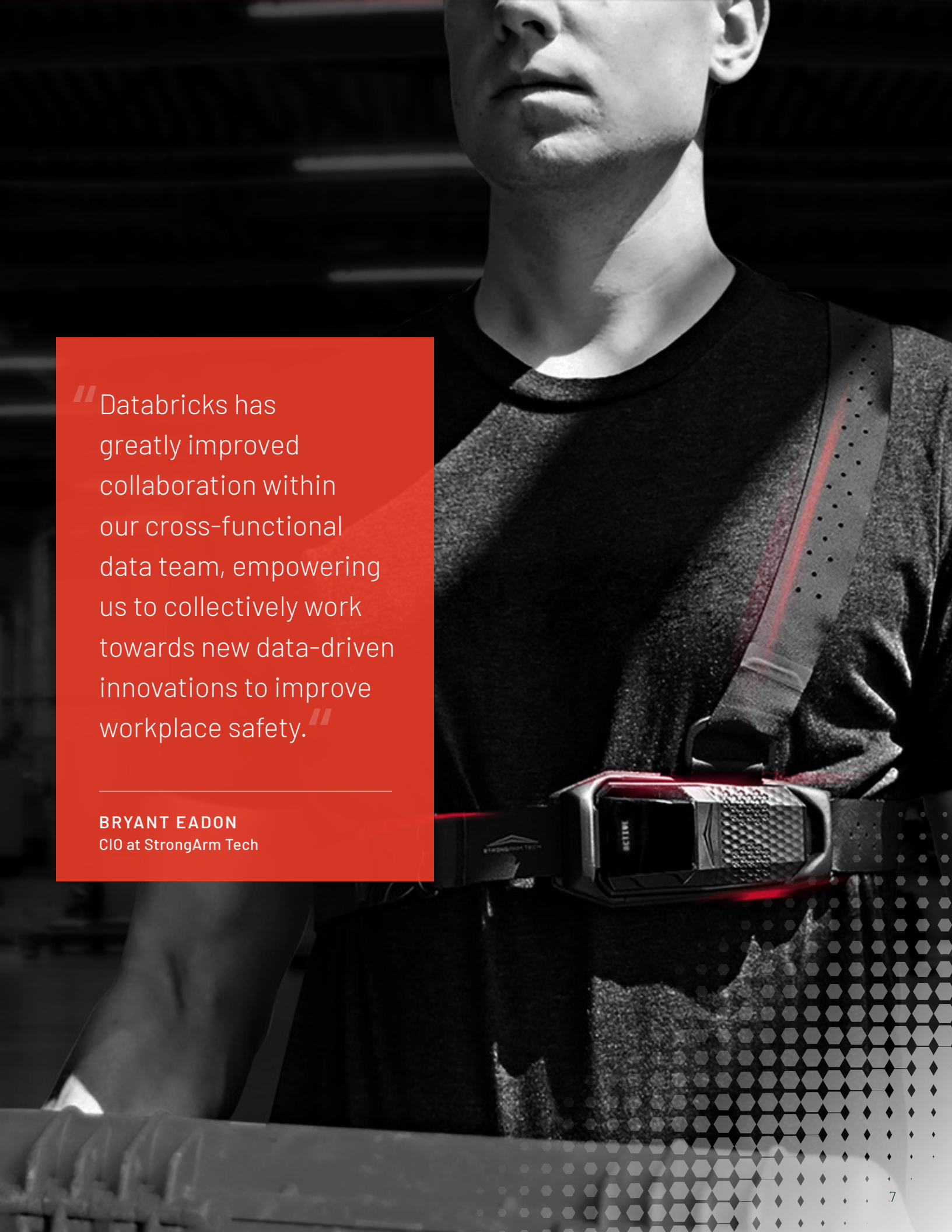
reduce the margin of error for evaluating injury risk from 23% to just 5%—**an improvement of 78%.**

Moving forward, StrongArm intends to weave in more data sources that are less structured and can provide different perspectives on how to prevent injury—from data-driven warehouse design and layout to using geolocation to prevent injury, such as someone getting hit by a forklift, before it occurs. Results like StrongArm's make it undeniable that employers who leverage data and AI to solve their biggest business challenges can experience significant business value as they drastically improve the experience for their end customers.

"We are in the business of protecting the Industrial Athlete. This is a massive problem that not only impacts the entire global supply chain of some of the biggest companies in the world, but it also affects the families of the workers in these warehouses who have so much more to lose," explained Eadon. "Databricks allows us to unleash the power of data and machine learning to help workplaces become safer, more productive, and a better environment for tens of thousands of industrial workers that we count on in our own everyday lives."

Databricks allows us to unleash the power of data and machine learning

"Databricks has greatly improved collaboration within our cross-functional data team, empowering us to collectively work towards new data-driven innovations to improve workplace safety."

**BRYANT EADON**
CIO at StrongArm Tech

# About Databricks

Databricks is the data and AI company. Thousands of organizations worldwide —including Showtime, Shell, Conde Nast and Regeneron — rely on Databricks' open and unified platform for data engineering, machine learning and analytics. Databricks is venture-backed and headquartered in San Francisco with offices around the globe. Founded by the original creators of Apache Spark™, Delta Lake and MLflow, Databricks is on a mission to help data teams solve the world's toughest problems. To learn more, follow Databricks on Twitter, LinkedIn and Facebook.

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