



## Transforming Agricultural Industries with an IoT Platform, Driving 30 Percent Lower Costs

“It’s imperative for us to present the data that matters, with answers to questions, rather than delivering raw data and forcing the user to sift through it. We’ve focused on providing comprehensive solutions that surface those key data points directly to the end user proactively.”

— Mike Prorock, Founder and CTO, mesur.io

### Overview

mesur.io is transforming industries such as agriculture, golf and turf management, mining, and vineyard management by instrumenting the Earth with the largest global climate-aware network—delivering rich, data-driven insights that improve operational efficiencies and environmental compliance.

The infrastructure empowering mesur.io is a cloud-based **Cloudera** enterprise data hub that combines smart sensor data with other sources of information, resulting in new insights and 30 percent lower personnel costs for clients.

### Impact

Building its solution on Cloudera has delivered ROI to mesur.io from an infrastructure development and management savings perspective.

“We haven’t had to build out your traditional team of multiple developers and separate QA,” said Mike Prorock, mesur.io’s founder and CTO. “We’ve been able to take a very flexible, fine-tuned, modern DevOps approach to developing our platform.”

For clients, mesur.io alleviates manual processes, affecting their bottom lines. Small agriculture shops and single-owner operators with tight operating margins have lowered personnel costs by up to 30 percent and reduced the time they require personnel onsite by leveraging mesur.io to monitor climate-controlled conditions within the grow house.

The solution also delivers new insights. Golf courses, for instance, are learning that certain fairways behave very differently in terms of water usage profiles due to soil types, light conditions, and other factors—even within 100 yards of another fairway on the same course.

“If there is a drought condition present where the course needs to be stricter on its water usage, the course can clearly identify which fairways will be ok with less water versus others where the valves should be kept open,” explained Prorock.

mesur.io makes these insights actionable by non-technical users on a daily basis by, for example, sending text alerts to field workers proactively highlighting areas of concern.

Bringing anonymized data from across its client base together, allows mesur.io to build a holistic picture of environmental conditions so it can advise clients on more efficient uses of resources.

“Our goal is to drive an efficient shift from monoculture and single, large-scale agricultural approaches to more sustainable approaches that will apply as we use up certain elements within Earth’s resources,” said Prorock.



## Key Highlights

### Industries

- Agriculture
- Life Sciences
- Public Sector

### Location

- Chapel Hill, NC

### Business Applications Supported

- IoT platform to optimize operational efficiencies of farms, golf courses, and vineyards

### Impact

- Infrastructure development and management savings to mesur.io
- Clients report 30 percent lower personnel costs
- New insights empower operational efficiencies and environmental sustainability improvements

### Data Sources

- In-ground sensors
- Handheld measurement devices
- Satellites
- Geographic information systems (GIS)
- Weather data
- Traditional databases (providing information related to plants, biomasses, species' behaviors, and business data)

### Solution

- Modern Data Platform: **Cloudera Enterprise**
- Workloads: Analytic database, operational database, data engineering
- Components: **Apache Hive**, Apache Ranger, Apache Spark, Apache Spark Streaming, Cloudera Manager
- Databases: MongoDB, Cloudera
- BI & Analytics Tool: Qlik Sense
- ETL Tool: Qlik, Trifacta

### Big Data Scale

- Many TB and growing
- New data ingested every millisecond

## Business Drivers

mesur.io set out to fill a gap in the environmental and agricultural market: There's historically been no comprehensive or cost-effective solution that combines sensor data with other sources including satellite and business data to benefit organizations operating in these industries.

A golf course client, with 90 courses in different climates for instance, didn't have a good way to understand water usage patterns, fertilizer expenditures, or turf management costs at the individual course level.

Additionally, agricultural organizations don't typically have IT departments with technical resources to mine data. "It's imperative for us to present the data that matters, with answers to questions, rather than delivering raw data and forcing the user to sift through it," explained Prorock.

## Solution

mesur.io's Internet of Things (IoT) platform collects data from sensors and streams it into a cloud-based Cloudera data hub for data engineering, analytics, and operational database workloads. Within 24 hours of implementing mesur.io, sensors begin sending data to Amazon Web Services (AWS), where it is funneled into Cloudera using Apache Spark. Within 72 hours, mesur.io delivers a complete picture of the environment to end users via a web application or Qlik Sense front end, offering details like soil moisture/temperature, humidity, microclimates, air temperature, water temperature, carbon dioxide levels, and light levels. This data then stays up to date in real time.

"All of that data, when combined together with the external weather data and satellite data, paints a complete picture to help the customer efficiently manage their landscape," said Prorock.

Use cases for the platform include:

- Determining crop production, fertilizer usage, and yield rates on large farms
- Optimizing crop rotation within small-scale agricultural operations
- Maximizing efficiencies in aquaponics
- Monitoring water usage both across and within farms and golf courses
- Ensuring environmental compliance and proactively detecting unsafe situations

The platform incorporates secure access controls to attach incoming data to specific customers, devices, and timeframes in order to delineate who should and should not have access to data as it arrives.

## Why Cloudera

mesur.io selected Cloudera on AWS for several reasons:

- Flexibility to scale and spread compute power across regions, rapidly and affordably, as well as to accommodate varying workloads, data and sensor types, measurement update rates, and capacity demands
- Manageability, security and controls. Mesur.io can store data from numerous customers with clean partitions and access controls. Additionally, using Cloudera Manager staff can efficiently deploy, replicate, and scale the platform.
- Interoperability to leverage open source components, such as Spark, so users can explore data in a freeform environment. Additionally, integration with third party software, enables non-technical users to digest insights from the platform in real time.

## About Cloudera

Cloudera delivers the modern platform for data management and analytics. The world's leading organizations trust Cloudera to help solve their most challenging business problems with Cloudera Enterprise, the fastest, easiest, and most secure data platform built on Apache Hadoop.

[cloudera.com](http://cloudera.com)

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