SWARM ENGINEERING

Couchbase

Giving business users next-gen technology to quickly and easily optimize supply chains

SWARM Engineering provides a SaaS platform that lets organizations in the agri-food industry optimize their supply chains using next-gen cognitive computing. SWARM makes it easy for business users to define problems and rapidly match them to advanced solutions without any software coding or knowledge of advanced AI or machine learning. Customers using SWARM save millions of dollars, minimize waste, and reduce their environmental impact.

Challenges

- Consolidate data and minimize system configuration and maintenance
- Enable customers to pivot their supply chains quickly to navigate unforeseen circumstances
- Identify and capture institutional knowledge for customers so it's not lost when employees leave

Outcomes

- Couchbase enables quick SQL implementation, unlimited scalability, fast prototype development, and allows data scientists to access all data from one place
- Customers achieve 400% faster planning time with an average ROI of 3-10x
- An AI-powered digital assistant interviews users to capture tribal knowledge, constraints, key interdependencies, and helps users identify and benchmark critical challenges

Industry
- High Tech

Customer application
- AI and ML based supply chain optimization platform

Use case
- Key-value store
- Application performance
- Application flexibility

Product
- Couchbase Capella

Key features
- SQL++
- Caching
- In-memory database
- Multidimensional scaling

Cloud provider
- Microsoft Azure

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— **Bill House,** VP of Engineering, SWARM Engineering

THE CHALLENGE: SUPPLY CHAIN PROFESSIONALS NEED TO PIVOT FASTER

SWARM's platform is predominantly built for business users in planning and logistics groups at multinational agriculture companies. With the efficiency of the agri-food supply chain in their hands, their work has an enormous impact across their organizations. As a result, it's extremely important that they can make adjustments quickly when their inputs change – for example, if fuel prices spike, bad weather strikes, or transportation issues arise. Excel spreadsheets and other planning tools are simply too time-consuming and inflexible to pivot fast enough.

Another common issue facing agriculture companies is that they lose too much institutional knowledge when an employee leaves or retires. Traditional planning and logistics tools don't provide an efficient way to capture that information, and more importantly, they don't provide a good way to identify what kind of data needs to be captured before it's gone.

THE SOLUTION: AN AI-POWERED PLATFORM ANYONE CAN USE

One way SWARM helps clients capture and access knowledge is with their AI-powered digital assistant AVA, the world's first AgriFood Virtual Advisor. Users can work with AVA to identify and benchmark the critical challenges that their business is facing. AVA can also interview operational team members and managers to capture tribal knowledge, constraints, and key interdependencies. When a new user logs into the SWARM platform, they can quickly come up to speed simply by asking AVA their questions.

SWARM uses its technology to straddle the edge between disrupting and optimizing a customer's existing processes. The primary way of doing this is through their freemium Challenge Modeler product, which provides easy-to-use templates that help users rapidly define and understand their business challenges.

There are many types of modelers available, but what sets SWARM apart is its repeatable Challenge Engineering™ methodology that focuses on putting business decision-makers back in the driver's seat. "With so many models and technical terminologies, it can be overwhelming for a business decision-maker," said Bill House, SWARM's VP of Engineering. "Our goal is to provide them with a system where they can clearly articulate their challenges and goals, and then we solve those challenges in a way they can easily understand and implement."

SWARM built their platform with Couchbase Enterprise Edition on Microsoft Azure, and they plan to move to the fully managed Couchbase Capella™ DBaaS shortly. That move will allow them to dedicate more time and resources to developing new and existing products.

There were numerous reasons SWARM chose Couchbase to meet their needs, including fast prototype development, quick SQL implementation, a key-value store, and unlimited scalability to support future growth. SWARM also wanted the peace of mind provided by Couchbase that once it was set up, it would work reliably without constant tinkering.

"When you use Couchbase, you're essentially outsourcing the whole data distribution and scaling question, and it's going to do a more consistent job than you would do yourself," said House. "Scaling with MySQL would have taken much more configuration and would lead to data fragmentation. Couchbase enables much quicker implementation, and all the data is in one place."

Having all the data in one place makes it much easier for the data science team to run optimization algorithms and return a speedy solution to clients.

"With indexes set up properly, I can go 10 levels deep in a hierarchy with a SQL++ query and get results back within 50-70ms," said House. "What Couchbase has done with SQL++ has been one of the most innovative things done in the database space in decades."

THE RESULTS: SAVINGS OF AT LEAST $1 MILLION PER OPTIMIZATION

Most customers come to SWARM because they're looking to optimize their agri-food supply chain. One example is a labor planning organization that works with a blueberry and asparagus producer in South America. They have to consider many layers of optimization when planning both labor and transportation logistics. For example:

- Location – Their daily laborers are spread out in remote villages. This encompasses thousands of employees in thousands of different locations who need to be transported to many different fields each day.
- Transportation – To determine which vehicles should be used to transport which employees, they must consider each vehicle's capacity, whether it has four-wheel drive, and whether it is functioning properly or needs repair.
- Employee skill set – Some workers are more skilled at picking either blueberries or asparagus.
- Weather – In rainy weather, roads may be washed out between the employees and the fields they need to work in.

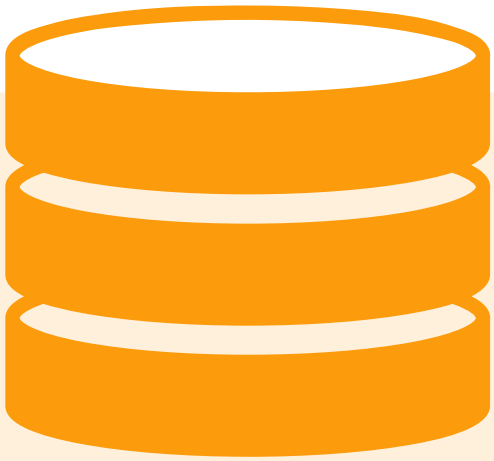
SWARM refers to this type of situation as a "multi-objective optimization problem." By using AI to solve these organizational challenges, human error is eliminated and the optimal solution that meets all the organizations' needs is easily identified. No matter the type of supply-chain problem, if a customer provides a clean dataset, SWARM can get them deployed with visible results in as little as three months.

"The promise to our customers is that we will save them at least $1 million per optimization, with an average return on investment of 3-10x," said Holly Self, SWARM's VP of Marketing. "Their reduction in planning time is around 400%. And the SWARM system can accomplish in seconds or minutes what typically takes a human days or weeks, depending on the size of the dataset."

SWARM is also helping companies with their environmental, social, and governance (ESG) metrics and carbon emissions. Some customers are interested in sustainability and preventing food waste, while others are required to track and report carbon emission metrics to the state.

By helping clients optimize travel and reduce driving, SWARM is having a direct impact on reducing carbon emissions. And by helping customers harvest crops on time and efficiently pairing them with imminent orders, SWARM is reducing food waste. In addition to being better for the environment, this eliminates unnecessary labor and improves the customer's bottom line.

Most of SWARM's customers are in the United States, but they plan to roll out in Latin America and Europe soon.



Modern customer experiences need a flexible database platform that can power applications spanning from cloud to edge and everything in between. Couchbase's mission is to simplify how developers and architects develop, deploy and consume modern applications wherever they are. We have reimagined the database with our fast, flexible and affordable cloud database platform Capella, allowing organizations to quickly build applications that deliver premium experiences to their customers – all with best-in-class price performance. More than 30% of the Fortune 100 trust Couchbase to power their modern applications.