

Industry

- [Healthcare](#)

Customer application

- E-medical records

NoSQL solution

- [Customer 360](#)
- [Field Service](#)

Use case

- Healthcare 360
- User profile store

Product

- [Couchbase Mobile](#)

Key features

- [N1QL](#)
- [In-memory database](#)
- [Full-text search](#)



BackpackEMR was born in 2014 after a trip to Peru gave the company's founder insight into the medical experience of rural communities. To increase efficiency, cut costs, and streamline operations while improving patient care, BackpackEMR provides mobile clinics with critical technology that's missing from most standard patient-tracking solutions. The BackpackEMR system seamlessly manages up to 20 devices and transfers up to 60,000 documents within seconds. To date, BackpackEMR has helped provide healthcare to 50,000 patients across 19 countries. With Couchbase and AWS BackpackEMR has greater efficiency, lower costs, and most importantly for its patients - better care.

CHALLENGES

- Rural clinics had to use paper medical records due to limited or unreliable electricity and internet connection.
- Mobile clinics had to store paper records at a fixed remote location, which meant they weren't available on-site for future follow-up care
- Using paper charts and records is time-intensive, decreasing the number of patients that can be seen in a day

OUTCOMES

- Offline-first peer-to-peer networking creates a seamless patient experience and cuts charting costs by 20% compared to paper
- When internet access is available, all patient records sync to the cloud, enabling clinics to access the data for future care
- BackpackEMR's SaaS has reduced manual processes by 25% and increased the number of patients seen by 30%

“Oftentimes, these clinics have limited or no internet access. The peer-to-peer synchronization in Couchbase Mobile enables patient data to be shared across the clinic seamlessly in real time.”

— **Lori Most**
CEO, BackpackEMR

When you're a software developer, you never know where your next big idea will come from. For Lori Most, founder and CEO of BackpackEMR, her greatest inspiration came from the remote rural communities of Peru.

In 2013, after spending more than a decade in retail, logistics, and healthcare, Lori was ready for a different kind of challenge. Her sister went on regular humanitarian missions to Peru with a mobile medical clinic, so Lori joined one of those trips to see if her skills might be of benefit.

The challenge: Collaborating without electricity or internet

In Peru, it didn't take long for Lori to realize how her development experience could make a significant impact. Many remote communities served by mobile clinics have extremely unreliable electricity or internet—or none at all. As a result, clinics were forced to use paper medical records, which present numerous challenges.

For starters, paper records are more difficult to create and manage. And because there's only a single record, only one person can access it at a time. "Efficiency takes a big hit," said Lori. "After a day at the clinic we had to stay up until one o'clock in the morning shuffling papers to schedule surgeries for the next day. It was a little maddening."

Another problem was that paper records had to be taken back to the U.S. after each mission, which meant the clinic didn't have those records on hand the next time they visited Peru. As a result of all the inefficiencies, doctors saw fewer patients and weren't always able to optimize their care.



The answer: Peer-to-peer sync with Couchbase

Lori looked for an off-the-shelf software solution that could be used for electronic medical records (EMRs), but she came up empty. Most modern medical facilities don't face the same challenges as remote clinics, so all the solutions were either cloud-based or required a local server. Modifying existing software wasn't a viable option either. "EMR technology is so complicated," said Lori, "that when you say the word EMR people run away. We needed simple, simple, simple."

In 2015 Lori put together a team to find a more viable option. **The solution they landed on was offline peer-to-peer syncing—and Couchbase Mobile provided the ideal foundation.** Couchbase already enabled peer-to-peer sync, so BackpackEMR added in some custom code to make it work offline. The end result was that you could run an entire clinic on separate devices.

“If someone’s at registration, they just type in the patient information and take photos,” explained Lori. “That data immediately gets sent to the exam rooms, to the pharmacy, to the lab. Everybody’s got it. At one organization, they’ve got 20 devices talking to each other at the same time and the speed is literally instant.”

The low-cost BackpackEMR hardware consists of iPads, iPhones, keyboards, and a router, all of which fit in a backpack. The mobile app is downloaded onto the devices. Patient data is stored and shared locally. And data is backed up securely to the cloud when a connection is available.

Couchbase and AWS Better Together: Greater efficiency, better care, lower costs

BackpackEMR went live in 2016 and is already used by 12 organizations to serve 50,000 patients in 19 countries.

On average, BackpackEMR enables mobile clinics to see 30% more patients while also providing better care. Automated reporting has reduced hours spent on manual processes by 25%. And the move from paper to electronic charts has cut costs by 20%.

BackpackEMR has also pivoted to address COVID-19. When the pandemic forced clinics to cancel their visits to other countries, BackpackEMR provided a lifeline that didn’t exist just a few years ago.

“We use Couchbase to sync with our AWS cloud infrastructure,” explained Lori. “The offline first functionality of Couchbase allows local clinicians to see patients and the global availability of AWS enables clinicians to send the charts up into the cloud. Specialists in the U.S. can then review the charts, provide feedback, and send them back down.” BackpackEMR also released a new module specifically for COVID-19 that lets clinics partner with existing health systems, tracking tools, and reporting systems.



At Couchbase, we believe data is at the heart of the enterprise. We empower developers and architects to build, deploy, and run their mission-critical applications. Couchbase delivers a high-performance, flexible and scalable modern database that runs across the data center and any cloud. Many of the world’s largest enterprises rely on Couchbase to power the core applications their businesses depend on. For more information, visit www.couchbase.com.