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How AEDES uses Couchbase to improve health services in central Africa

By **Jon Reed**   December 19, 2017

SUMMARY:

At Couchbase Connect, I heard the inspiring story of AEDES – and how they partnered with Couchbase to build CERHIS, a mobile hospital information system that could change healthcare in central Africa.

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Sometimes wandering into the wrong room is the best idea in the world. That's what happened to Loïc Vaes of AEDES, a public health consultancy.

But as he told me at Couchbase Connect Silicon Valley, Vaes wasn't working for AEDES at that time. He was simply looking for a project to sink his teeth into.

At the time, AEDES needed help developing better technology to serve their health information systems clients in Africa (this project eventually became CERHIS). AEDES is a consulting company focused on clients in French-speaking African countries. Some of these clients were medical facilities, struggling with the burden of paper processes. Vaes:

"
[These hospitals] use registers to record all information about the patients. It's one line per patient, and there are twenty five like that in the hospit

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must rewrite the same data each time: the name, the address, and everything, and then a bit of the medical data.

Events like lab exams are laboriously documented:

"
For example, in a laboratory you have 1,500 lab exams a month. At the end of the month, you have to do a report, and manually count how many lab exams have been completed.

Project obstacles and paper processes

Vaes joined the project, and eventually became Project Manager, Health Information Systems for AEDES. But in the early days, Vaes was just looking for a solution. How could they upgrade the technology while working within the limitations of budget and network unreliability? The first attempt at a solution used computer tablets:

"
I started with tablets, because we had problems with laptops – people didn't know how to use them. So we moved to tablets, and I did a website for that. That was an Intranet server. It was written in Python, and the tablets were able to access the website.

Connectivity problems remained:

"
Then we had the same problem. The network went down, and everything was stuck. The local website had more tablets connecting to it, so it required a bigger server. I looked for a native application on the tablets. That was the first step in going to Android.

That led Vaes to a database search, which had to include offline capabilities:

"
We started looking for which database to use, and how it could solve that huge problem of how to handle the fact that the tablets would be disconnected sometimes – as we all know it is going to happen.

Vaes and another colleague teamed up with doctors to better understand the needs:

"
We started to develop, and we worked with doctors from Belgium and doctors from Africa and got their input.

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That led to the realization that data structures were a huge issue. Which in turn led them to NoSQL:

We knew the data structure was going to change. So working with a NoSQL, schema-less database was more interesting. It was just a good fit for use: documents in NoSQL were able to handle documents in a hospital.

Once the need to sync from Android tables on an unreliable network was factored in, Couchbase turned out to be the best NoSQL choice:

That was the miracle that Couchbase provided that was very helpful. That was definitely the selling point for us.

Vaes spent 2014 writing the applications, but when it came to pilot the app with real data, Vaes took a stand:

I came out to my boss one day and I told him, "Okay, it's finished. We're going to work with Android and Couchbase from now on."

Loïc Vaes at Couchbase Connect

In April 2016,, AEDES shifted technology to work in Java with Android Studio and Couchbase. The product is now available for all AEDES clients under the name CERHIS – a Tactile Hospital Information System.

In July 2016, the pilot phase started at the CHMK, a health center in Kinshasa, DRC:

We put it in a hospital in Kinshasa. Kinshasa is the capital of the Democratic Republic of Congo. We've worked with them progressively to integrate the feedback, and send new versions. It's allowed us to progressively come to a project that fit their needs.

The Couchbase project goes live – user reactions

Then came the all-important question: how would users react to CERHIS?

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"
It's funny – the first day I came out there, I expected to spend one day or something like that, teaching to use the tablets. But they knew everything. They skipped directly to the Androids and smartphones that most people knew.

The ease of use motivated both sides:

"
Yes, it was fun for them to use. Because there was an emulation tool, they learned from each other – it's motivating.

It was a lot more fun to use than Windows systems:

"
On Windows, they're afraid of mistakes. Maybe it's going to crash, or there is an update or whatever. But with this, you just launch the system; it's touchscreen. They really liked it. That was very motivating to continue.

The reduction in admin chores was amazing:

"
Before, if you had to find the exams from someone who came three months ago, you had to go back 1,500 lines in the paper, find the name, hoping it wasn't misspelled or something, and hopefully the person can remember the date.

Now those documents are electronic, and searchable. With the latest version of Couchbase 5.0, search has been further enhanced. AEDES was able to build the system with Vaes and one lead developer. Plus: some consulting support from Couchbase. Typically, Couchbase does not provide consulting support for the Community version of Couchbase, but Couchbase made an exception in this case, to provide consulting to support the health mission.

The wrap – expansion plans and lots of Couchbase training

Now that the first CERHIS project has gone well, it's time to expand. AEDES recently held their own local Couchbase workshop, bringing four local technicians up to speed. At the time I spoke with Vaes, he was gearing up for a big travel push:

"
Tuesday, I'm going back to Congo to install it in three hospitals in Kinshasa. In Congo, the Ministry of Health is very interested and quite enthusia

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Europe. There are 9,000 health centers, 500 hospitals, and we are working with local technicians.

A lot more Couchbase training is on deck:

"

We were laughing because we counted, and to install a system in all those hospitals in just one day per hospital, it's going to take us 25 years. So they will have to recruit new people and train them.

Vaes showed me a hospital picture of where they had previously archived their paper files. It was literally behind a set of bars:

"

I'm going to say that during the presentation today, I think. One of the mottos of Couchbase is "Liberate your data." And right here it's behind bars...

Not anymore.

Image credit - Feature image by Catherine Trautes, hired by CERHIS project. It's a picture of the laboratory in the CHMK, the "Centre Hospitalier Mutualiste de Kinshasa" in Kinshasa, Democratic Republic of the Congo - used by permission of AEDES. Photo of Loïc Vaes by Jon Reed.

Disclosure - Couchbase paid the bulk of my travel expenses to attend Couchbase Connect.

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