



### Business challenge

To help its clients make smarter post-acute care decisions, Profility needed a platform that could manage complex patient data while facilitating compliance with HIPAA privacy and security rules.

### Transformation

Profility uses IBM® Cloudant® to store semi-structured medical records in a highly secure dedicated IBM Cloud™ environment, and run it through powerful predictive models to recommend appropriate care pathways.



**Ohad Barzilay**  
Vice President of Research and Development  
Profility

### Business benefits:

#### **Gives**

patients a higher chance of receiving high-quality care in a facility close to home

#### **Helps**

providers plan post-acute care to reduce length of stay and risk of readmission

#### **Provides**

insight to help payers assess post-acute care costs and risks more accurately

# Profility

## Improving post-acute care for patients and providers with highly secure cloud-based analytics

Headquartered in Boston, Massachusetts, Profility is a technology provider that helps healthcare and insurance clients optimize decisions around care planning and gain deeper insight into treatments and outcomes. The company uses profiling algorithms to find the best care pathways for each individual patient—looking beyond the numbers and averages to personalize care.

*“To assess the best care pathway for a patient, we need to store and analyze their medical records. IBM Cloudant proved to be an ideal solution.”*

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## The tyranny of averages

In many countries, health systems are facing the challenge of providing appropriate and affordable care for an aging population. Elderly people may need to visit their doctors more frequently, take medication more regularly, have a higher risk of requiring surgery, and take longer to recover afterwards. As a result, as the proportion of older people within a society grows, its healthcare costs are likely to rise significantly.

One of the biggest drivers of healthcare costs is inadequate post-acute care, especially for older people. After a successful surgery, a patient may be discharged from the hospital relatively quickly—but if they don't receive the care they need at the right kind of post-acute care facility, it may delay their recovery or even lead to readmission. Repeated cycles of hospitalization can take a significant physical, mental and emotional toll on patients and their families, as well as multiplying the cost of care for payers and providers.

Profility, a specialist in personalized care planning, was created to solve this exact problem. The company's founders realized that the same algorithms used in search engine advertising could be equally relevant in the healthcare domain, as Ohad Barzilay, Vice President of Research and Development, explains.

"The current state of planning for post-acute care is very hit-and-miss, because it's based on assumptions about what works best for the average patient. But there is no such thing as an average patient—every case is unique.

"Our approach is to build a specific profile for every patient and then analyze the care history of patients who have similar characteristics. This enables us to make personalized predictions about the likely outcomes of different care pathways for each individual."

Profility began collaborating with InterRAI, a network of researchers and practitioners that focuses on developing evidence-based clinical practice by collecting and interpreting high-quality data. By training predictive models against InterRAI's data-sets, the Profility team was able to fine-tune its algorithms to provide very precise recommendations about post-acute care.

"The next step was to encapsulate our algorithms in a system that healthcare providers could use to assess their own patients," says Ohad Barzilay. "However, to get the solution to market, we had to solve some tough technical and regulatory challenges. In particular, how could we design a solution that would make it easy to demonstrate compliance with HIPAA and other laws around data privacy and security?"

## Accelerating product development

Profility applied to join the [IBM Alpha Zone](#), a 20-week program that helps startups develop solutions for the enterprise market. After successfully pitching its ideas to the Alpha Zone team, Profility was accepted and began working with senior IBM architects to design a cloud architecture for its new solution.

"The main issue was how to manage the data for incoming requests from clients," says Ohad Barzilay. "To assess the best care pathway for a patient, we need to store and analyze their medical records. Those records can arrive in a variety of semi-structured formats, and the data is highly sensitive—so we needed a database that would be both highly flexible and extremely secure. [IBM Cloudant](#) proved to be an ideal solution."

IBM Cloudant is a fully managed NoSQL document store that can run in the [IBM Cloud](#) or on premises. To meet its data privacy and security requirements, Profility chose to run its Cloudant instance on dedicated hardware in the IBM Cloud—ensuring that patient data is held in a physically and logically separate environment from all other systems. Cloudant distributes the data across a cluster of multiple servers, enabling horizontal scalability and fault tolerance, and its schemaless design allows it to capture medical records in a variety of formats without needing to normalize them into a rigid relational structure.

To power the back-end of its solution, Profility uses [IBM WebSphere® Application Server](#). A combination of the open source Open Liberty project and IBM technology, the platform makes it easy to develop and deploy Java applications, and keeps resource requirements low with a slim runtime, low memory footprint and fast startup. The Java applications integrate with a front end web portal written in Microsoft .NET, as well as the core big data matching engine, which is written in C++.

Clients can either log into the web portal and upload medical records for processing, or integrate the solution directly into their own systems. When a new request is received, the Profility solution saves the relevant data and metadata to Cloudant, then uses its algorithms to compare the patient's information against a large dataset of previous patients' medical histories. By identifying similar cases and their outcomes, the solution can provide detailed recommendations about what type of post-acute care facility is most appropriate for the patient and which treatment plans might be effective.

The solution also keeps track of the progress that the patient makes during their stay at the facility, and can provide updated recommendations in real time to help caregivers make better decisions as the patient's condition improves. This also adds a rich source of data about treatment pathways that can help Profility improve the accuracy of its predictions in the future



## A quiet revolution in post-acute care

With support from the IBM Alpha Zone team, Profility was able to make the leap from prototype to full production in the IBM Cloud within just a few weeks—enabling the business to start building relationships with clients and delivering value almost immediately.

“It’s no simple task to build a system that is secure enough to meet the HIPAA requirements, and most of the time we spent migrating to the IBM Cloud involved setting up and validating the security standards,” says Ohad Barzilay. “But having the mentorship of senior IBM architects really made it a smooth process, and I’m sure we were able to launch much faster thanks to support from IBM.”

Clients in the healthcare and insurance sectors have now been using the Profility solution for several months, and the initial results are very promising. The company is confident that its solution will empower healthcare professionals to accelerate the post-acute care planning process, enabling hospitals to discharge patients to care facilities sooner. And by recommending higher-quality care facilities that offer more appropriate treatments and are located closer to patients’ homes, the company predicts that its clients will see a reduction in the average length of stay, and a lower rate of readmissions.

Ohad Barzilay concludes: “We’re delighted to see the solution prove its value to our clients by helping to optimize post-acute care decision-making, reduce costs and improve outcomes. But the real benefit is that insights from our solution are helping patients get the support they need to regain their health faster and get home to their families sooner.”

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Ohad Barzilay, Vice President of Research and Development, Profility

### Solution components

- IBM® Cloudant®
- IBM WebSphere® Application Server

### Take the next step

To learn more about IBM Cloudant and other IBM Cloud solutions, please contact your IBM representative or IBM Business Partner, or visit [ibm.com/cloud/cloudant](http://ibm.com/cloud/cloudant)

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