

# Radius Care CMS Data Lake



## Executive Summary

Radius Care is a leading healthcare provider that owns the only software that actively monitors a person's individual health data. Radius Care uses real-time healthcare data to show an individual ways to make better decisions about their healthcare options.

Radius Care provides personalized insights into health in the following areas:

- Finding the best doctors within a given radius
- Comparison of healthcare providers
- Medication savings
- Prescription storage and reminders
- Appointment reminders
- Education on specific conditions
- Monitoring healthcare changes
- Easy-to-read health reports

This project involved fulfilling Radius Care's need to effectively analyze terabytes of historical healthcare data. The objective of the analysis was to create comprehensive dashboards and to inform the development of future Machine Learning (ML) models.

## The Challenge

To meet the client's needs for this effort, Envative needed to develop a very complex data aggregator, using Machine Learning logic to detect patterns in insurance claim data in an attempt to reveal more efficient and successful healthcare paths.

The data would need to be sourced from several partners, including the federal government. Adherence to data privacy and security provisions was, of course, of paramount concern and the system needed to ingest and report on millions of records within seconds.

The challenge also included the growth of this data overtime. As we receive future data, we needed a way to easily store and load that data, and to automatically include it into existing reporting and analysis tools.

## Why AWS?

To address these challenges, Envative proposed the creation of a new data lake using AWS Glue and AWS Athena. AWS S3 and AWS Glue help us here by providing a secure area to load additional future months / years of data and automatically catalog it for use in our existing queries.

- The AWS Glue service will be used to prepare and load the data.
- AWS Athena will be used to analyze the data.

Athena makes it easy to analyze data directly in Amazon S3 using standard SQL, making it ideal for the creation of dashboards and for performing ad-hoc data exploration and analysis.

## About Radius Care



Radius Care is a leading healthcare provider that owns the only software that actively monitors a person's individual health data. Radius Care uses real-time healthcare data to show an individual ways to make better decisions about their healthcare options

With a goal of giving individuals the tools to live a longer, happier life, they use technology to help them power their healthcare choices. With a vision for continuously building tools optimized to help users understand, engage, and activate. Utilizing clever AI that uses machine learning to empower people to achieve the very best possible health outcomes.

## Partner Solution:

The objective of the data analysis is to create comprehensive dashboards and to inform the development of future Machine Learning (ML) models. To address this, Envative created a new data lake using AWS Glue and AWS Athena. The AWS Glue service is used to prepare and load the data while, AWS Athena is being used for analysis of the data.

The process entailed loading of all the historical healthcare data into the data lake. In order to effectively do this, Envative needed to transform the data into a suitable format, load it into the data lake, and set up the necessary queries and integrations, and then implementation of the related dashboards. Rigorous testing of the system was then done to ensure it met all of Radius Care's requirements.

We were also able to securely query this data from AWS SageMaker using AWS Data Wrangler and Jupyter notebooks.

- Data Wrangler to prepare query results from Athena as suitable inputs for ML training jobs in SageMaker.
- Jupyter notebooks for developing ML models, launching hyperparameter tuning jobs and evaluating model performance.

## Results and Benefits:

By setting up a data lake, Envative was able to provide Radius Care with a robust, scalable and secure infrastructure for data analysis, while also future-proofing the system to allow for additional services to be built off the source data.

- The solution Envative developed provides Radius Care with the capabilities needed to create comprehensive dashboards and information organized in such a way as to feed the development of future Machine Learning (ML) models.
- The benefits included significantly reducing the time for adhoc queries and analysis of the data. Instead of tens of minutes, we were able to get query time for reports and adhoc queries down to seconds.
- The result is that we have an end-to-end ML processing pipeline for developing new models against our datalake and launching inference endpoints within AWS SageMaker so that these models can be consumed throughout the application and within reporting queries.
- With the ability to analyze healthcare data in a more in-depth and insightful manner, this solution provides Radius Care with an ability to significantly improve recommendations to their users.

## About Envative

Envative, an AWS Select Tier Partner, is a 100% US-based software development company that specializes in custom web development, mobile apps and internet of things (IoT) solutions. They serve as an essential technology partner for billion-dollar corporations, Fortune 500 companies, start-up businesses, and the like. Known for building state-of-the-art, end-to-end software solutions in a variety of industries that include Healthcare; Finance; Security; TelCom; Manufacturing; Hospitality; Robotics and Government, they've secured their reputation as a talented and trusted partner.

