

AWS Health Competency – Case Study

National Institutes of Health (NIH), University of Massachusetts-Amherst, and ECG Collaborate to Reduce Falls through AI, Computer Vision, and Virtual Caregiving.

Overview

Falls are a major cause of injury and death in older adults. Annually, over 25% of Americans aged 65+ experience a fall, resulting in 3 million patients being treated in a hospital for fall related injuries and thousands of premature deaths. Moreover, the cost of falls to the health care system exceeds \$50 billion annually. Elderly with Alzheimer’s Disease (AD) and Alzheimer’s Disease Related Dementia (ADRD) have a double to threefold increased risk for the occurrence of falls. Despite the staggering number of reported falls each year, many go unreported because they don't cause serious injury or require treatment. Of those reported, most are only identified after the fact often during an ER visit. Coupling these challenges with the sporadic, in-clinic during the once a year physical, the true scope of falls remains dramatically underestimated.

As the healthcare system has moved to hybrid models of care with more care being delivered in-home, the NIH launched an initiative to leverage AI to address major issues impacting older adults. ECG partnered with U Mass – Amherst to tune algorithms associated with ECG’s FAITH module – Functional Assessment In The Home – and fast track commercialization of this key tool. Leveraging the AWS Health Data Accelerator infrastructure, omnichannel sources of data are captured and analyzed to inform clinicians of the falls risk of patients and direct care at home. A 10% decrease in falls reduces hospital care by 300,000 individuals and saves the health care system over \$5 billion, annually.

Opportunity: Developing an AI-model for Anytime, Anywhere Falls Risk Assessment

The NIH is the most prestigious healthcare research entity in the country. As care is pushed to the home, an opportunity emerges to capture a diverse set of data to assess health, identify risk, and proactively manage care. ECG’s experience with and use of the AWS Health Data Accelerator enables falls risk to capture not only video data and assessment from a patient’s performance on a battery of functional assessments, but also real time and historical data on chronic health, hospitalizations, prior falls, medications, vital signs, sleep patterns, stress, living arrangements, and other factors impacting risk of falls. While this is a diverse set of clinical and non-clinical data, research has indicated that these are all contributors to risk of falls. ECG’s FAITH model includes all of these data inputs. This assessment can be done at any time and at home – fundamentally changing the model by which this falls risk assessment – and interventions – have been done.

30% of physicians expect to retire in the next decade. The Addison Care FAITH module makes falls-risk assessments available to every older adult in America without burdening a single clinical

professional. The AI-driven algorithms provide on-edge, on-demand assessment to decrease risk of falls and proactively inform care professionals of adverse developments. This is how to transform access to care, improve outcomes, save money, and leverage clinical resources.

Solution – Leveraging AWS for Comprehensive, Scalable Data Capture and Analysis

To identify and incorporate the right data sets for a comprehensive, real-time falls risk assessment, ECG leveraged the AWS Health Data Accelerator. The AWS Health Data Accelerator offers an out-of-the-box reference architecture with recommended services and tools to fast-track development of ECG’s generative-AI based data infrastructure for the work with the NIH. The solution uses Amazon QuickSights for data analytics, Amazon Elastic Compute Cloud (Amazon EC2) for scalable and reliable compute infrastructure, and Amazon Simple Storage Solution (Amazon S3) for the most durable storage in the cloud and industry-leading availability. Given the variable nature of the use of the FAITH module, the elasticity of AWS enables customers to automatically scale resources based upon demand, ensuring optimal performance and cost optimization.

Outcome – Expanding Access to Care to Make Falls Risk Assessments Universally Available

Conducting validated, accurate, functional assessments in-the-home is transformative. Transitioning from an episodic, reactive, and calendar-driven model to a dynamic, flexible, and proactive model of falls risk assessment represents one of the best uses of applied generative-AI, computer vision, data analytics, and computer. The scalability of the AWS-based data infrastructure, coupled with the elasticity of the cost and availability of utilized resources, enables providers to scale access to falls risk assessments to every connected household across the country.