



Success Story.

Leveraging DICOM & Azure Storage For HIPAA Compliant Storage Solution

About the Client

Founded in 2009, the client develops innovative medical 3D Imaging products for foot and ankle specialities. The clients Cone Beam CT imaging equipment provides the same features and capabilities at a significantly lower cost compared to traditional CT equipment.

Business Challenge

The client faced challenges in software engineering, with core expertise in medical devices and hardware /mechanical engineering. They were working on a Windows application to view CT & 3D rendering images, that would be stored in-house and accessible by authorized users.

They lacked technical expertise to define a secure and HIPAA compliant architecture to manage the large storage required for each patient's medical images. Apart from security, the images had to be accessible anytime & anywhere with high time availability.

The client sought a service provider with HIPAA compliance experience and with software engineering expertise.

This would involve leveraging the Digital Imaging and Communications in Medicine (DICOM) standard for storing and transmitting the medical images. The application would have a powerful user authentication and rights management engine.

Infogain Solution

Infogain was chosen based on our track record of successfully helping medical device and healthcare companies with their HIPAA compliance and software engineering challenges.

The project involved leveraging the Digital Imaging and Communications in Medicine (DICOM) standard for storing and transmitting the medical images. The application would have a powerful user authentication and rights management engine to ensure a high level of security and comply with HIPAA.

Infogain used the FOVIA framework for 'server based' volumetric 3D rendering of images. It also supports DICOM data. This helped overcome the high machine & CPU requirement limitations associated with volumetric reconstruction and processing of 3D data. With the FOVIA framework enabled server based image processing, 3D designs can be viewed and processed from a web browser on any machine, without worrying about the underlying machine configuration.

After studying the existing application and interfaces, Infogain proposed a multitenant web application with a cloud storage at the back end for storing images. Azure SQL DB and Azure blob storage was chosen after a PoC. Images would be received from different clinics, termed as the "Active Storage" and pushed into the Azure SQL DB. This data can be retrieved immediately as and when needed.

Images that did not require immediate access were moved to a cost effective yet secure Passive Storage which is the Azure blob storage service. Active images from Azure SQL DB could be moved to the Azure blob storage and vice-versa.

Images sent by participating clinics would be processed and rendered by the DICOM protocol before being pushed to the appropriate storage based on requirements.

The solution was protected by Microsoft security and availability SLA's for cloud based storage. The architecture implemented by Infogain ensure seamless access to images with the ability to manage costs by moving images from "hot" storage to "cold" storage. The architecture allows high performances even with image sizes of ~600 MB. The Azure blob storage can store several Terabytes (TB) of medical images cost effectively.

Technologies Used



PROGRAMMING
LANGUAGE

.NET MVC , C#



DATABASE
Azure SQL DB



RD
3RD PARTY TOOL
Fovia SDK



STORAGE
Azure Blob Storage

Client Benefits

SECURE & HIPAA COMPLIANT SOLUTION

The client's key requirement was to ensure security and compliance with industry regulations. Infogain architected a solution that completely met these requirements, by implementing the right architecture and recommending Azure cloud storage backed by Microsoft's 99.99% SLA's.

HIGHLY AVAILABLE AND ROBUST SOLUTION

The Time taken to process medical images render it to a browser was within acceptable range. The use of centralized image storage was a best fit solution, and accessing the images via Internet comes as a natural extension.