Case Study

How we **Integrated Patient Data from heterogeneous EMR systems to a HIPAA-compliant Cloud Data Warehouse**

IDEAS2IT

The Client Context

The client is a global MedTech company. As part of its lab's initiative, the firm runs a global program to expand healthcare access to financially underprivileged patients and treat their non-communicable diseases (NCD) like hypertension, hearing loss, diabetes and more. To scale up programs, the company usually collaborates with local governments and large healthcare institutions.

The Requirement

The program leverages several government hospital systems to reach patients. So the client had to integrate with a wide range of EMR systems run by government agencies to import patient data on to its Cloud platform.

The client also mandated robust analytics to improve operational efficiency and to communicate the impact of the program's initiatives to stakeholders. As it involves PII and ePHI data, security and privacy are of paramount importance.

The Solution

We at Ideas2IT first put together a cross-functional team of Data Architects, Data Engineers, Mule Integration Engineers and DevOps Specialists to design and develop an end-to-end HIPAA-compliant Cloud Data Warehouse, with integration capability to collect data from multiple EMR systems. We also implemented a comprehensive data pipeline to transform, anonymize and handle the load.

The Integration Platform

As different EMRs supported different standards like HL7, FHIR, EDI etc., we leveraged MuleSoft's Anypoint Connectors to handle HL7 messages by using HL7 MLLP connector to send and receive messages, and the HL7 EDI connector to interpret the HL7 message.

Given that HL7 is a loosely defined standard and two different implementations of HL7 can represent data differently, we implemented a robust data mapping layer to map the source data format to a source neutral layer (SNL). Then, the SNL was mapped to the canonical data model of Data Warehouse.

The Cloud Data Warehouse

We built a S3 based Data lake and leveraged AWS Glue to build a data pipeline to populate AWS Redshift based data warehouse. AWS Quicksight was leveraged for robust dashboards.

The Security

The infrastructure was designed from the ground up for security with the right VPCs, fine-grained IAM setup and so on.

Data encryption at rest was implemented for all the components like S3 Data Lake Buckets, Redshift and Glue services in AWS and AWS Quicksight SPICE engine. Data in flight was encrypted using SSL.
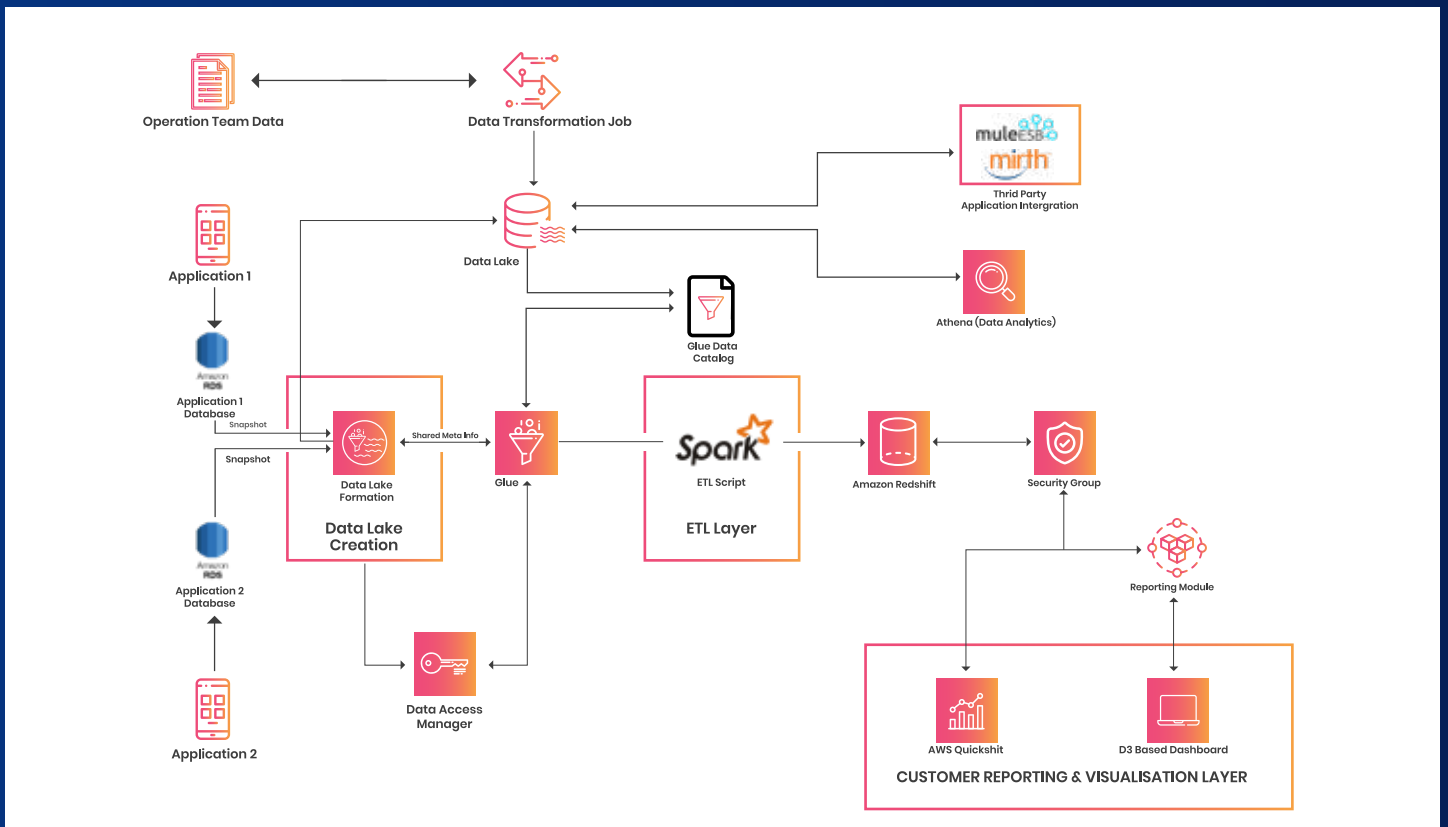
The Benefits

The platform had the ability to ingest EMR data from a diverse set of EMRs, irrespective of the source technology, and it supported a wide range of protocols.

About Ideas2IT

Founded by an ex-Googler, Ideas2IT started its journey as a high-end product engineering partner for Silicon Valley startups. Ideas2IT has produced 150+ top-quality applications for 100+ clients such as Microsoft, Oracle and Opportun. Ideas2IT offers specialist capabilities in the domains of Data Science, IIoT, Blockchain, Cloud-based SaaS, Robotic Process Automation, Frontend, Backend & Fullstack Development and Intelligent Chatbots.

To know more, **talk2us@ideas2it.com** or visit **www.ideas2it.com**