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Automated Patient Identification Solution Which Increased Clinical Trials Efficiency for Exact match in Patient Enrollment

Project Details

Customer Size	Mid-size Organization
Country	US
Domain	Healthcare
Technology	MVC views, jQuery, JavaScript, Telerik Kendo UI, Google Visualizations, Biztalk Server 2013 R2 Enterprise Edition FTP, SFTP, MSMQ, and HL7, HTTP and HTTPS, SQL Server, SSAS, SSRS

Data Architecture To Find Exact Match in Clinical Trial

Client Profile

Client is a renowned Health IT organization based in the US delivering innovative technology solutions for health data monetization and value creation with specialization in clinical trials. They have a strong team of 120 employees and an expert healthcare advisory board developing various first-to-market products and solutions. Their products have been revolutionizing the Healthcare industry since 2003 for which their CEO has won several awards and possesses a stellar track record when it comes to innovation.

> “Automate Tedious Manual Process of Patient Enrollment and Site Selection for Clinical Trials”

Business Scenario

Client required a solution to automate complex and tedious manual process of Patient Enrollment and site selection for various Clinical Trials. Their profound understanding in the Clinical Trials space allowed them to identify an issue related to inaccurate and insecure patient screening procedure. The manual procedure deprived medical researchers from identifying the Exact Match for Clinical Trials. Owing to satisfactory experience of getting a HIPAA compliant EMR solution from Cygnet in the past, they approached Cygnet for:

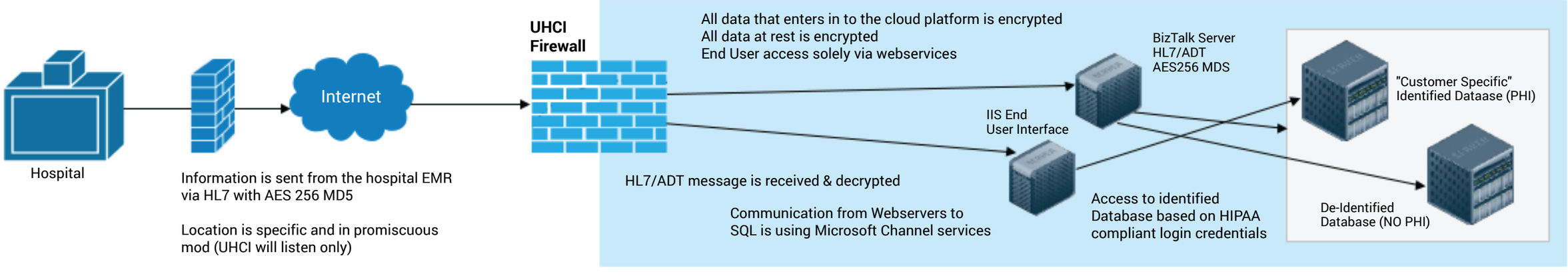
- → Developing an algorithm which can extract accurate data from stringent inclusion and exclusion protocols and their criteria
- → Developing a solution which is compliant with various healthcare privacy laws, governance and regulatory laws without restricting the flow of the patient information
- → Solution with near real-time analytics capabilities helping the client meet their enrollment timelines

Cygnet's Solution

Cygnet developed a market-ready product with a full proof, HIPPA compliant algorithm and provided a secure Patient Health Data processing flow compatible wth HL7 messaging standards.

A data architecture enabling exact match in patient enrollment procedure for clinical trials with ability to fetch real-time data and near realt-time data processing and analytical capabilities was developed using following Microsoft SQL server capabilities:capabilities was developed using following Microsoft SQL server capabilities:

- An encrypted outbound-only HL7 interface setup for a secure real-time tranfer of patient information from end customer's EMR system to the client application server using the Microsoft Azure Platform
- The data from EMR system was packaged into HL7 messages where each message a combinaion of various patient treatment sections such as:
  - MSH segment contains Message Header information
  - EVN segment contains Event Type and date/time of event
  - PID segment contains the Patient Identification
  - PV1 segment is for Patient Visit data
  - PV2 segment (optional) is for additional Patient Visit data
  - MRG segment contains patient merge information
  - DB1 segment (optional) contains information related to the disability of a person
  - AL1 segment (optional, repeating) describes a single patient allergy
  - DG1 segment (repeating) is for Diagnosis codes
  - DRG segment (optional) is for Diagnosis Related Groups
  - PR1 segment (optional) is for Procedure Codes
  - IN1 segment is for Patient Insurance information
  - OBR segment is a repeating segment that identifies a clinical observation request
  - OBX segments follow their related OBR segment and transmit a single observation/result in each segment
  - RXA (optional) segment is to transmit vaccination/immunization data
  - ORC (optional) segment is for medications
  - RXO (optional) follows the ORC segment for new and updated medications
- Also, to identify the diseases and past lab records fo patients, the system supported data import from ICD-9 and ICD-10 along with the CPT data. For lab report integration data from LOINC was imported
- Apart from Hospital's EMR, Cygnet's solution also gave an option to import relevant patient data from open source website where people from across the globe voluntarily submit their data with desire to participate in clinical trials in their area
- Once the data is extracted to the "listen only" system, it is then further decrypted and sent to identified (only accessible by the end customer) and de-identified servers
  - De-identification is employed by masking the personal identifiers and suppressing the quasi-identifiers
- The data is then converted into a file and matched with various indexes where each file contains 5000 feeds of clinical procedure
- Once processed, the data is displayed as final results where patients are ranked graphically to provide quick and user-friendly visual format for selection



Additional Capabilities of the solution:

- The solution was developed as per the patient enrollment requirements of the Hospitals, Life Science organizations and was also capable of breaking data silos for combined and sponsored clinical trials
- The algorithm had capability to process 1.4 million of data in 20 minutes from the complex inclusion and exclusion based protocols (150) where each protocol contained 60 criteria
- Azure Suite and HTTPS data transfer compulsion with HIPAA security standards providing authority-based access to confidential patient data
- The solution aids not only in patient enrollment but also in site selection while processing various attributes such as under-performing sites, study budgets, and timelines to reduce the administrative burden for sites

Benefits to the End Users

- → Enabling hospitals and Life-Science organizations in getting government grants
- → Enabling sponsored and collaborated clinical trials
- → Breaking down silos for accurate data processing
- → Reduction in administrative cost of manual screenings by 43%
- → Significant reduction of 87% in patient screening time due to processs automation
- → Secure and healthcare privacy compliant system with almost no re-identification possibility

Benefits to the Client

- → Development of a patented algorithm
- → A robust and scalable solution to cater to hospitals, life science organizations and large scale sponsored clinical trials
- → Usage of 2 indexes that helped in optimum data coverage leading to exact match of patient for various clinical trials

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