

Real-time Enterprise Interoperability

How Azure FHIR-based Prior Authorization data exchange helped with regulatory compliance and accelerated care management initiatives

The benefit management organization of a leading national Payer (18.6 Mn membership) faced significant challenges in creating internal healthcare information exchange for the entire Payer ecosystem. The client provides utilization management (UM) services for programs such as radiology, cardiology, musculoskeletal, medical oncology etc. For care coordination and regulatory compliance reporting, the client needed to share prior authorization (PA) data (100K cases/day), clinical and care specific data with the Payer organization.

Due to the disparate nature of its internal UM systems, this exchange of information was primarily batch-based and delayed. CitiusTech spearheaded the initiative and built an enterprise platform using Microsoft Azure services and Kafka, enabling real-time data exchange and accessibility, enhanced care management and compliance with CMS and ONC regulations.



CASE STUDY

BUSINESS CHALLENGE

Client faced significant challenges in data interoperability which includes:

- **Extracting data from multiple internal UM source systems:** Extracting PA data and associated clinical data is complex and time-consuming, requiring integration with different systems and ensuring data consistency and accuracy.
- **Creating a unified enterprise data format:** To make the extracted data available in a unified enterprise data format requires transformation and standardization. It requires careful mapping and data modeling to ensure compatibility and consistency across the enterprise.
- **Compliance with regulations:** The client needed to ensure compliance with the ONC regulations on information blocking and with CMS Interoperability Rule ensuring secure exchange of patient health information between consented healthcare stakeholders.
 - **Enabling shared data across the enterprise for a unified experience:** This involves integrating data from different systems and making it accessible to authorized users in a seamless and efficient manner.
 - **Enabling coordinated care services and population health analytics:** This involves analyzing the data to identify trends, patterns, and insights that can support care coordination and population health management initiatives.



CITIUSTECH SOLUTION

Approach and Architecture

CitiusTech met with several client stakeholders to discuss and understand the requirements related to the enterprise interoperability initiative. Through multiple brainstorming sessions and workshops, our consultants, with deep expertise around the client's business domain and technical ecosystem, helped the client to define the future state architecture and solution roadmap for the following workstreams:

- PA and associated clinical data collection from different UM systems and real-time transformation into a unified

data canonical structure using Azure Databricks - making it available in a standardized H7 FHIR format across the enterprise.

- Mapping of transformed PA and clinical data to the Da Vinci Payer Data Exchange (PDex) and Prior Authorization Support (PAS) recommended FHIR resources and loading to Azure FHIR Service via Kafka stream and microservice-based ingestion apps.
- PA and clinical data access using Azure FHIR for real-time data sharing and automated PA request-response workflows.

Enterprise Healthcare Information Interoperability was envisioned as an enterprise streaming data platform with a publish-subscribe model. The platform was architected on Kafka by leveraging Azure FHIR services to enable near-real-time sharing. The solution leverages Azure services to address real-world challenges and drive adoption, contributing to Microsoft's ecosystem growth. By utilizing a cloud-native architecture on Azure FHIR, we enabled future scalability and adaptation, empowering our client's digital transformation.

With AKS and Kafka, we have built a highly scalable architecture capable of handling large volumes of healthcare data in real-time. Leveraging Azure's security features and compliance certifications, our solution ensures data security and regulatory adherence. Through Azure Application Gateway and Storage, we guarantee high performance and reliability. Azure's flexibility allows our solution to anticipate and adapt to evolving requirements, fostering innovation in healthcare.

Throughout the project, CitiusTech partnered closely with the client to align with their business objectives, ensuring independent scalability, reduced go-to-market time, and improved workflows.

Development using MS Azure services

CitiusTech adopted a cloud-native architecture leveraging Azure's PaaS capabilities. By using the Azure FHIR server, the team could focus on the core business implementation without infrastructure concerns. The solution implemented a microservice-based architecture using Azure Kubernetes Service (AKS) for management, scalability, and improved security.



Following are Azure services leveraged for the solution:

- **Azure FHIR Server:** Used Azure FHIR Server as it's a mature product for HL7 FHIR-based health record storage. Prior auth info stored as Explanation of benefits (EOB) FHIR resource, with patient and health plan data in Patient and Organization FHIR resources. Custom parameters utilized for resource querying.
- **Azure APIM:** Used to organize internal microservices, route requests, and to enforce security policies.
- **Azure Blob Storage:** Used to securely store clinical documents for client access (Patients, Providers).
- **Azure Application Gateway:** Used to expose REST services, routes client requests to internal APIs, and enforce organization-specific security policies.
- **Azure Kubernetes Service (AKS):** Used to deploy internal data ingestion services, providing automated management and scalability for clusters.
- **Azure Databricks:** Used to collect clinical information data from various source systems and transform into HL7 FHIR format.
- **Application Insights:** Used for centralized logging with alert configurations for failure notifications.



VALUE DELIVERED



Enhanced Data Acquisition Efficiency: **30% reduction achieved** in data acquisition efforts, facilitating better data consumption with an enterprise-level agreement.



New Revenue Model: **\$3 Mn+ revenue per annum** through monetization of API used by Providers and channel partners to get the prior authorization status.



Provider Burden Reduction: **~20-30% reduction in Provider burden**, enhancing operational efficiency and service delivery.



Accelerated Care Management: Real-time data availability accelerates care management initiatives, enabling proactive healthcare interventions.



Regulatory Compliance: Initiative ensures compliance with CMS Interoperability Rule and ONC regulations, demonstrating commitment to data security and privacy.



Business Growth and Cost Efficiency: Initiative drives business growth, improves cost efficiency, and enhances health outcomes through digital coordinated care and population health management.





Shaping Healthcare Possibilities

CitiusTech is a global IT services, consulting, and business solutions enterprise 100% focused on the healthcare and life sciences industry. We enable 140+ enterprises to build a human-first ecosystem that is efficient, effective, and equitable with deep domain expertise and next-gen technology.

With over 8,500 healthcare technology professionals worldwide, CitiusTech powers healthcare digital innovation, business transformation and industry-wide convergence through next-generation technologies, solutions, and products.

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