

# Solving the Challenge of Multi-EHR Data Integration

## Client Overview

The client is a leading provider of comprehensive cloud-based solutions designed to streamline operations for healthcare organizations. Strongly focusing on electronic health records (EHR) and practice management, they empower healthcare providers to improve care delivery and optimize administrative workflows. With years of experience in healthcare and IT services, KPi-Tech provides high-level support to enhance their business, offering custom software development services that accelerate growth and improve operational efficiency.

## Business Need

As the client expanded its reach across the healthcare market, many incoming provider organizations were using legacy EHR systems such as Allscripts, MD-Reports, Aprima, Greenway, and NextGen. Migrating clinical and administrative data from these disparate systems into the client's proprietary platform was critical to ensuring continuity of care and operational readiness. The client needed a robust, scalable solution to:

- Extract structured and unstructured data from various EHRs
- Convert and normalize the data into a consistent format
- Accurately map the data to the client's system schema
- Eliminate manual workflows to reduce errors and onboarding time

KPi-Tech helped the client design and implement an automated, repeatable data migration process.

## Challenges

The migration project involved several complex data integration challenges:

- **Multiple EHR Systems:** Data originated from a range of EHRs with varying database structures, formats, and export capabilities.
- **Inconsistent Data Formats:** Data exports were received in HL7, CSV, XML, text, and SQL formats, requiring customized transformation workflows.
- **Manual Extraction Effort:** Without a standardized interface, initial data extraction processes were manual, time-intensive, and prone to errors.
- **Complex Mapping Requirements:** Accurately aligning and transforming legacy data fields to the new system's schema required significant domain knowledge and validation.

Over 70% of healthcare organizations struggle with integrating data from multiple EHR systems, according to KPMG's 2023 Healthcare Report. This lack of interoperability contributes to significant workflow delays for 65% of providers, as highlighted by a HIMSS Analytics study. However, research from IDC Healthcare Insights shows that automating data integration can reduce manual data handling by up to 75%, enhancing both speed and accuracy.

## Our Approach

KPi-Tech implemented a modular ETL solution using Talend Data Integration, tailored to handle various data ingestion scenarios and formats. Our team worked closely with the client's technical and onboarding teams to ensure a seamless integration process, carefully mapping out the data journey to determine the most effective points for data manipulation, whether before or after ingestion, based on the client's unique needs.

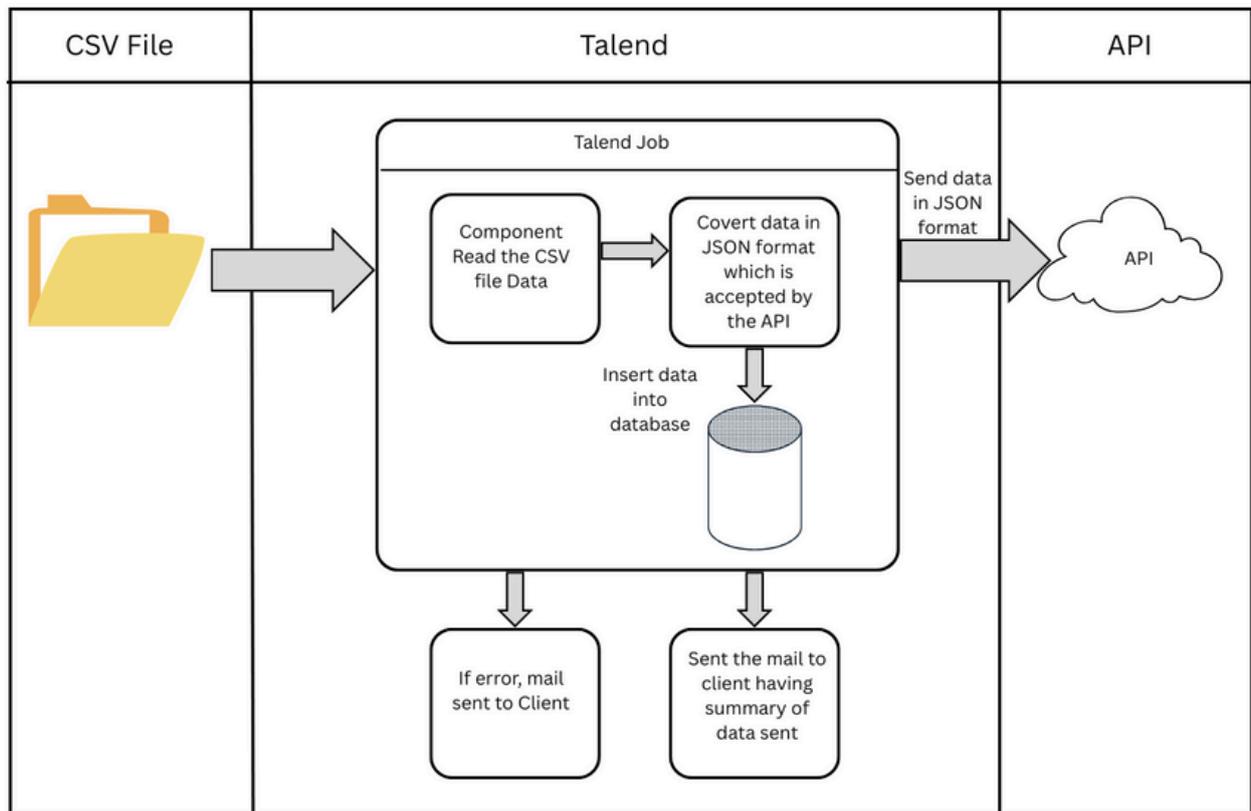
Highlights of the Solution:

- **Developed Talend Jobs to support two data intake models:**
  - Our team built a robust and adaptable ETL framework using Talend to support various intake methods based on the source system. We extracted structured clinical data directly from EHR databases such as Allscripts and MD-Reports. In cases where direct access wasn't available, we processed exported files in formats like HL7, CSV, XML, and TXT. For systems offering modern interfaces, we integrated via REST APIs and FHIR endpoints to pull batch or real-time JSON data. Often, a hybrid approach was used, combining these methods based on the source system's capabilities and constraints.
- **Designed reusable transformation workflows** using Talend's full range of data transformation models, including row-by-row, batch, lookup, and rule-based logic to convert and normalize diverse formats such as:
  - HL7 → JSON
  - CSV → JSON
  - Text/XML → JSON
- **Data Normalization & Mapping:** Incorporated field-level validation and mapping logic aligned with the destination system's schema. Built reusable transformation logic to ensure accurate mapping of patient demographics, insurance data, appointments, orders, results, and clinical documents.
  - Built a modular architecture to support rapid onboarding of new data sources and clients.
- **Automation & Error Logging:** Integrated comprehensive data logging and error-handling mechanisms within Talend jobs. This included job execution logs, row-level error tracking, and exception handling for malformed or incomplete records—ensuring transparency and simplifying troubleshooting.
- **Audit & Traceability:** Established audit trails for every data load cycle, enabling validation and compliance monitoring.

## Core Technologies

- ETL Tool: Talend Data Integration
- Data Sources: Allscripts, MD-Reports, Aprima, Greenway, NextGen
- Data Formats: HL7, CSV, XML, TXT, JSON
- Target System: Proprietary Healthcare Platform
- Environment: On-Premise & Cloud-Compatible Deployment
- Database: PostgreSQL (for staging and transformation)

## Solution Architecture



## At a Glance

Leading provider of cloud-based healthcare IT solutions, including EHR, practice management, and RCM services.

### Challenges

- Siloed data
- Manual Data synchronization
- Operational inefficiency
- Increased cost to the company
- Hindered Future integrations

### Solution

- Modular ETL solution with Talend
- Supported database, file, and API data intake
- Reusable workflows for HL7, CSV, XML, and TXT normalization
- Validation and accurate schema mapping
- Integrated error logging and audit trails
- Scalable for onboarding new clients and systems

## Results & Impact

- **Reduced Migration Time:**

Automation shortened the overall migration timeline by over 50% compared to manual processes.

- **Operational Efficiency:**

Minimized manual work and reduced dependency on technical staff for repetitive tasks.

- **Improved Data Quality:**

Robust transformation logic and validation improved accuracy and consistency of clinical data.

- **Scalability:**

The modular solution could be replicated for new clients with minimal rework.

**70%** reduction in manual data processing time was achieved through automation using Talend.

**90%** data accuracy in transformation and mapping ensured reliable clinical information integration.

**3X** faster onboarding of new provider organizations was enabled by the modular ETL framework.

**5+** legacy EHR systems were seamlessly integrated into the client's proprietary platform.

## Conclusion

Successful integration of clinical data from multiple EHRs requires more than just technical tools, it demands a deep understanding of healthcare data, flexible ingestion strategies, and a scalable transformation framework. This project demonstrated that with the right ETL architecture and close collaboration between technical and operational teams, organizations can overcome the complexity of legacy system migrations. As the healthcare ecosystem continues to evolve, repeatable, standards-based integration solutions like this can play a critical role in improving interoperability, accelerating onboarding, and supporting long-term digital transformation goals.

## Ready to Automate Your Clinical Data Abstraction and Integration?

Partner with KPi-Tech to reduce manual workloads and accelerate EHR transitions through intelligent data handling.

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### About KPi-Tech

KPi-Tech is an esteemed partner with a legacy spanning over two decades in Healthcare IT, complemented by an expansive influence across diverse industry landscapes. With deep-seated roots in both technology and healthcare, KPi-Tech has consistently led the way in orchestrating transformative solutions. For over 25 years, KPi-Tech has illuminated the path of excellence in Healthcare IT. Our journey began with a resolute focus on elevating healthcare experiences through the strategic integration of technology. Today, our legacy extends beyond healthcare, encompassing sectors as varied as finance, manufacturing, and beyond.