

WHITE PAPER

CLINICAL DATA INTEGRATION: ENGINE FOR IMPACTFUL CARE DELIVERY

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Evolution of Clinical Data Integration

Background

As Healthcare reform continues to evolve, we are seeing an increased emphasis towards value-based care management. A case in point is the emergence of the Center for Medicare & Medicaid Services (CMS) 'fixed discount' payment initiatives. Adoption across the Payer and health system communities of programs such as Bundled Payment for Care Improvement (BPCI) shows ongoing progression of the initiative to improve care-delivery. However, to achieve any measure of success, it is crucial for the stakeholders, namely Payers and their provider networks, to have an integrated and seamless data exchange environment. This has largely been an unresolved challenge in the industry today.

A concerted focus on meaningful care coordination, value based payment structures, and a stronger data exchange between Payers and their provider networks are each imperative to achieving care management objectives.

Solution

These developments coupled with the Patient Protection and Affordable Care Act (PPACA) mandates to form "Accountable Care Organizations" (ACOs) are driving Payers to invest in Clinical Data Integration (CDI), a concept that involves building a robust data integration layer to merge Payer administrative data with provider clinical data.

While there are several different types of ACOs operational today – industry research reveals that the best ACOs are Integrated Delivery Systems and Multi-Specialty Group practices. CDI is at the core of these practices, helping them to communicate data, and as a result, provide better care. CDI results go far beyond better communication; well-defined CDI models have been proven to help Payers achieve key population health management benefits through:

- 'Timely' care delivery interventions for members
 - In the form of medication adherence
 - In the form of wellness management tasks
- Reduction in the number of avoidable hospitalizations & availing of ER services
- Access to disease management and educational materials for members early identification & risk stratification of high risk/high cost members, with the provision of individualized care planning activities.

This document presents an insight into the key components of CDI, the role of CDI in Care Management and the conceptual approaches for Payers to consider when implementing CDI.

Business Case for CDI Implementation

CDI is a key element in driving any outcome-based care management initiative. With the passage of the Affordable Care Act (PPACA) and the movement towards value-based reimbursement models in the industry, a well-connected payer-provider network is more important than ever before. Use of CDI will drive efforts for improved care delivery, resulting in satisfied members and better utilization of network resources, ultimately leading to a cost-effective Care Management model.

An organization with expertise in CDI and systems integration can assist health plans to drive care management initiatives within its provider network. From a broad perspective, CDI achieves these objectives through a 4-tiered process:

- First, outline a “Clinical Data Integrator Layer” capability to source near-real time clinical data (pertaining to the Payer beneficiaries) from the network provider participants.
- Then, enhance existing Payer Operational Data Stores (ODS) to accommodate clinical data sets.
- Note: Most current Payer data stores support claim-based or member administrative data sets. With the prospect of member clinical data sets being aggregated from the participating provider network for care management purposes, it is important to relook at the capability of existing Payer data stores to accommodate clinical data as well.
- Third, facilitate data integration between the Clinical Data Integrator Layer and the enhanced Payer ODS via an ETL mechanism.
- Finally, facilitate data integration between the enhanced Payer ODS and the Population Health Management (PHM) platform via an ETL mechanism.

The steps listed above will result in the culmination and stratification of Electronic Medical Record (EMR) data with claims data. As a business solution for any organization interested in improving the delivery and payment of care, a CDI initiative will provide new opportunities in population health programs as well as best practices in meeting regulatory requirements. The below graphic (Figure 1) depicts the opportunity-view of a CDI implementation within an organization.



Figure 1: Competitive Advantage from CDI

CDI Enabled Care Management Model

CDI has gathered significant traction amongst the payer-provider community. Due to the large volume of clinical and claims data available, it can be confusing to determine what data to merge for ideal CDI outcomes. Configuration of the multiple data sources and data sets available to constitute a CDI enabled Care Management Model should be governed by organizational needs and CDI best practices. The below illustration (Figure 2) provides a conceptual CDI business architecture, which ties in different data sources and the potential integration points.

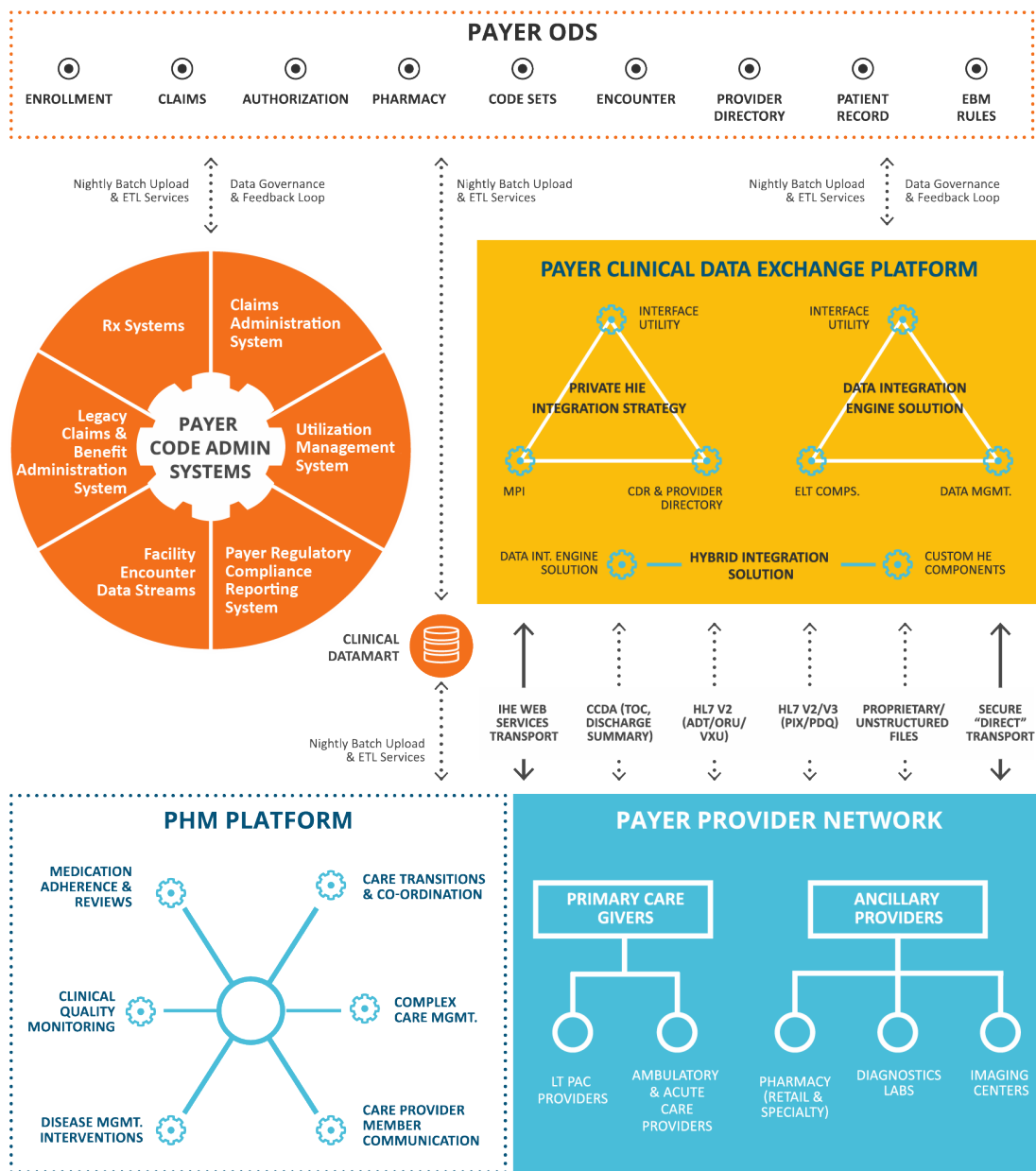


Figure 2: CDI Enabled Care Management Model

Components of CDI Architecture

The critical components of the CDI business architecture model include the following:

1. **Integration of all the Payer-Provider network participants** via a common data integrator layer. This layer generally encompasses one of the following 3 technical platform options represented in the form of an Approach comparison:

Technical Platform Options	Key Drivers for the Approach	Factors in favor of the Approach	Roadblocks
Full-fledged Third party HIE approach	Leveraging complex HIE capabilities around: <ul style="list-style-type: none"> • Clinical exchange services • Identity Management • Single member related clinical data repository • Consolidated provider directory • Secure / bi-directional messaging capabilities within the network • Cross exchange analytics / reporting based on evidence based clinical guidelines 	<ul style="list-style-type: none"> • Ability to tap into complex HIE use cases like <ul style="list-style-type: none"> ○ Secure communication ○ Identity Management ○ CDR & one-stop clinical data source • Supports most common clinical message payload mechanisms like HL7 v2/v3, C-CDA/C32, NCPDP SCRIPT, Rx messages • Supports most common clinical message transport mechanisms like SOAP based IHE web services & Secure SMTP 	High entry barriers, in terms of platform cost/services Longer time for implementation
Third party Data Exchange Platform approach	Primarily leverages data exchange services, that span across multiple message/document payload mechanisms & transport methods.	Relatively, low cost entry barriers; with focus only on clinical data exchange services Shorter implementation timelines Supports most common clinical message payload mechanisms like HL7 v2/v3, C-CDA/C32, NCPDP SCRIPT Rx messages Supports most common clinical message transport mechanisms like SOAP based IHE web services & Secure SMTP	Limited feature flexibility, especially if Payer has more complex PHM use cases as plans
Hybrid Integration Platform approach	Leverages third party clinical data exchange platform capabilities; and requires the build of some custom HIE components around use cases like consolidated	Custom control over features/ technology needs of the solution	Platform maintenance & product/technology upgrades might have to be handled

	provider directory, cross exchange analytics /reporting, single member-related clinical data repository		
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2. **Redesign/Extend the existing Payer ODS** to accommodate clinical data sets. This would then mean that the enhanced Payer ODS would encompass both administrative data sets, derived from upstream systems like FACETS, QNXT, etc., and clinical data sets, derived from the provider network participants via the clinical data integrator layer.
3. **Designing an Independent Clinical ODS** - As an alternative option to minimize any impact to the existing administrative Payer ODS, designing an independent clinical Payer ODS that houses all clinical data sets from the data integrator layer is an option that should be considered. This will require an additional set of integrations between the existing administrative Payer ODS and the clinical Payer ODS; thereby increasing the effort and cost to maintain the clinical Payer ODS. Below are options to consider for the integration:
 - Direct integration between the Clinical Data Integrator layer and the Payer ODS
 - Design a robust ETL mechanism to enable seamless data integration through a scheduled/unscheduled batch process
 - Effective data governance plan to manage and monitor the quality of data streams
 - Build a data management dashboard for monitoring end-to-end data integration process
 - Devise an ETL-based integration between Payer ODS and Clinical Data Mart
 - ETL mechanism to enable seamless data integration
 - Design report visualization functionalities to report on operational/PHM metrics
 - Data governance plan to manage and monitor the quality of data stream
 - Devise an ETL-based integration between the Clinical Data Mart and the PHM Database
 - ETL mechanism to enable seamless data integration
 - Data governance plan to manage and monitor the quality of data stream
 - Develop a feedback loop mechanism to consolidate source and target data streams

Industry Recognized Platforms for CDI

Once the appropriate CDI architectural approach is finalized, the next decisive step is to choose the right platform. There are multiple CDI platform vendors that exist in the market today; with key technical strengths catering to specific market segments like Payer and insurer based HIEs or standalone core HIEs.

The following table outlines different platforms categorized according to these segments. The listed products are amongst the best ranked Core-HIE platforms in 2014, as per analysis by “Blackbook Rankings”.

Market Segments	#1 Ranked HIE Vendors	Other Top Ranked HIE Vendors
Payer/Insurer-Based HIE	Covisint	<ol style="list-style-type: none"> 1. Availity (BCBSFL Humana) 2. Certify (Humana) 3. GSI Healthcare 4. Medicity (Aetna) 5. Medecision (HCSC) 6. Navinet Lumeris (BCBS VP) 7. Optuminsight (United)
Standalone Core HIE	ICA (Informatics Corporation of America)	<ol style="list-style-type: none"> 1. 4medica 2. Alere Wellogic 3. Caradigm 4. Care Evolution 5. Covisint 6. dbMotion Allscripts 7. GSI health 8. Harris healthcare 9. Healthunity

The following matrix outlines the popular health integration platforms present in the market today. The listed products are amongst the best-ranked COTS interface engine platforms in 2014, as per analysis by “KLAS Rankings”.

SI No	Vendor	Interface Engine Platform
1	Corepoint Health	Corepoint Integration Engine
2	Infor	Cloverleaf Integration Suite
3	InterSystems	Ensemble
4	NextGen Healthcare	Mirth Connect
5	Oracle	eGate
6	Orion Health	Rhapsody Integration Engine
7	Qvera	QveralInterface Engine
8	Siemens	OPENLink
9	Summit Healthcare	ExpressConnect
10	HealthUnity	HealthUnity Interface Engine
11	Kryptiq	Kryptiq Interface Engine

Sample CDI Use Cases

With an established CDI framework, Payers can now execute critical PHM & Care Management functions. Outlined below is a quick snapshot of specific Payer use-cases that can be supported via this closely integrated model:

- **Care delivery enhancements for Care Management team**
 - Provision of longitudinal clinical summary views for case managers
 - Assist in defining contextual care plans for members and sharing them with treating providers
 - Facilitating timely capture of clinical quality measure reports, utilizing the most recent/relevant member health indicators
 - Proactive determination of post-acute care settings (e.g. SNF/LTCH) for members and seamless care transition
- **Enhanced 'Payer-Network Provider' communication channels**
 - Secure email based communication exchanges between treating network providers and Payer care management team
 - Timely episode bundle-based alerts to Payer care management team (e.g. activate the Payer-contracted discharge planning staff, based on recent diagnosis at a treating provider site)
- **Consolidated network reporting capabilities**
 - Utilization Management KPIs (e.g. DRG/Facility/Region based top network utilizers)
 - Readmission Tracking KPIs (e.g. DRG/Facility/Region based readmission rates)
 - Periodic Medication Adherence KPIs
 - Member/Patient Outreach KPIs
 - Provider Network Redundancy rates (e.g. Test type/Facility/Region based redundant clinical tests)

Relevant Industry Success Stories

As an important stakeholder in the care continuum, Payers have recognized the role of CDI in Care Management. With promising incentives & rewards from value-based reimbursement models, Payers are beginning to aggressively pursue Care Management and value-based reimbursement models. There are notable instances where Payers have made strategic investments in acquiring HIE platforms and systems to aggregate claims data with clinical data. This collation from different provider networks provides actionable data to drive PHM initiatives. Outlined below, are two private Payer-led industry CDI success stories.

Aetna HIE Integration for Population Health

Aetna is one of the largest Payer organizations in the healthcare market, with significant number of subsidiary companies making up the entire organization. The Accountable Care Solutions from Aetna offer “Data Aggregation & Exchange” services. These services offer HIE capabilities that assist Aetna in driving its PHM efforts within the network provider participants. Some of the key capabilities include the following:

- Provisions for constructing an aggregated member health record
- Provisions for easy access to /publish operations on real time clinical documents within the network
- Extensive member engagement functionalities and enhanced cross-community clinical analytics and reporting capabilities

To make a significant impact on its Care Management and PHM initiatives, Aetna must access clinical data across provider networks. This need was instrumental, so Aetna acquired Medicity, a leading developer of HIE technology to aid in the solution. Medicity’s HIE platform enables health systems, hospitals, and physician practices to manage their patient populations through collaborative and secure data sharing. This allowed for care event notification and monitoring, financial and operational analysis, population insight and patient engagement. Medicity’s HIE platform enabled Aetna to spearhead value-based ACO and care coordination initiatives with leading IDNs and CINs like Northeast Medical Group, Mercy Health, Arizona Care Network, etc.

United Healthcare Group HIE integration for Population Health

United Healthcare Group (UHG) is a leading private Payer in coordinated care efforts across the health care continuum. Driven by Optum’s PHM solution, ‘OptumOne’, it offers Care Management across areas such as disease management, maternity management and wellness. Some of the key business cases for CDI within the Optum Care Suite portfolio include:

- Increased options for medical professionals to create customized, multi-provider care plans for patients based on each patient’s individual needs
- Facilitation of team-based approaches to patient treatments among all care-providing team members and closely tracking and documenting patient care across provider settings
- Aggregation of data from claims, clinical records and patient reported outcomes, and helping care navigators easily track and measure performance and compliance requirements
- Provision of population analytics, risk analytics and patient engagement and care coordination platforms

UHG was able to achieve these objectives, after the acquisition of Axolotl Corporation. The Axolotl HIE platform is designed to create a secure clinical network that connects participating physicians, hospitals, laboratory service providers and pharmacies in a specific region. The Axolotl HIE platform (as a part of OptumInsight) formed a critical component for UHG in facilitating care navigators to exchange clinical results from patients across the connected network as well as providing access an up-to-date medical record at the point of care.

Summary

The cases above are testimony to the fact that CDI is a growing influence and has an impactful role in enabling cost-effective care management for all the stakeholders involved. Organizations taking a proactive stance in response to our changing healthcare environment must be engaged in efforts to improve the payment and delivery of care. A powerful yet complex solution is the implementation of a CDI enabled Care Management Model. Knowing the right data sets and systems for implementation of the CDI enabled Care Management Model will save time and money. Finding the right partner is also critical to the success of the initiative. Use of an experienced vendor can reduce the HIT knowledge gap, shorten “the time to market” and take your organization closer to meeting their goals in improving patient care.

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