DxF Health and Social Data Exchange Reference Architecture

TASC Social Data Exchange Focus Group

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CalHHS

CENTER FOR DATA INSIGHTS AND INNOVATION

Overview : Reference Architecture/Capability Framework for Sharing Health and Human Services Data

The **California Data Exchange Framework (DxF)** faces a daunting challenge, enabling the flow of health and social services information to support whole-person care across the care continuum. Per the tenet of the Data Exchange Framework Roadmap on Social Service Data Sharing, DxF intends to build on existing community health and social data exchange activities and capabilities. **This is a document to help launch a learning systems approach to creating a social data sharing ecosystem** and does not pretend to be a final answer.

Counties play a primary role in the care continuum, serving as the local administrators of program benefits and the data systems used for service delivery and reporting for many public assistance programs. **We focused this initial review at the county level** due to the significant adoption of data exchange today with wide variation in approaches. We hope to help inform if and how State agencies can support data sharing at the local level, whether it be through data standards and/or leveraging statewide data systems.

The intent of this Reference Architecture is to identify the capabilities needed to securely share health and social services information **for care coordination purposes.** This means providing timely information and tools for collaboration when and where clients/patients are receiving services.

The model **does not imply that a single entity or technical platform** in a community or region is needed, but rather, **focuses on the common capabilities that support interoperability and data sharing**.

It is important to note that data sharing (where data stays in its original location) is not the same as data exchange (where data is moved to a new location), and this rubric purposefully begins with the former. The challenges of data governance, access, privacy and security become more complex when electronic data is stored outside of their original systems of record.

Reference Architecture Diagrams [and How to Read Them]

The Reference Architectures (RAs) provide a capability-based view of multiple data exchange models currently in production. Although the models differ in many ways, the RAs follow the same organizational pattern facilitating comparison across and between the models.

The RAs flow from left to right, with three (3) key sections: Data Sources, Capabilities for Care Coordination, and Data Consumers.

- Data Sources are represented by database icons. Each icon is colored to indicate whether it is a county (blue), community-based organization (gray) or state (yellow) database.
- In the middle, the green box includes the Coordinated Care Capabilities. The box outline is hashed to indicate that the capabilities are not necessarily collated. Capabilities may be supported as services from other systems, such as in San Diego CIE where Identity Management is provided by San Diego Health Connect. The ***DxF Reference Architecture Legend*** provides descriptions of each capability.
- Data Consumers are to the far right and represent the organizations accessing client information. Organizations have different levels of functionality, represented by icons for view only, data exchange, and edit.

Across the counties, we identified three (3) primary models; County services-driven, social/health coordination-based (CIE/SHIE), and Health services–driven (HIPAA expansion). For each model, there are specific county examples. There is also a General Model which distills the commonality across the others.

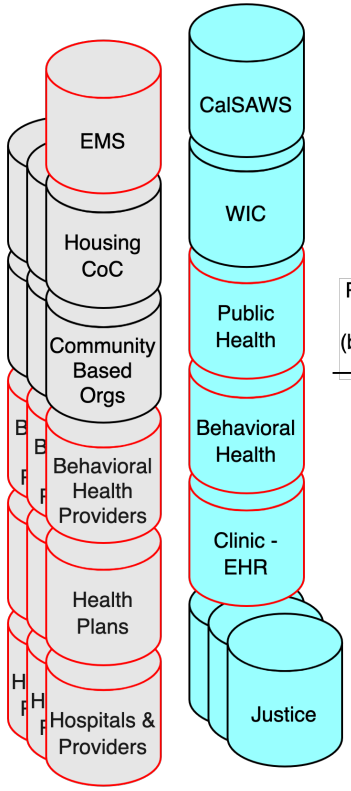
These county examples are in production and are not exhaustive—the intent is to create an opportunity for DxF to learn more about what is already successful across California, spur further adoption (and even identify other models!).

The General Model differs from the others in a few important ways. It includes a fourth category, Care Coordination Activities following the Coordinated Care Capabilities. It is generalized and therefore does not include the system level data exchange details of the other models. These Care Coordination Activities help translate how the Core Capabilities support user workflows.

Data Sources

Data Consumers

Capabilities for Coordinating Care



Demographics
Program Participation
Minimum Data Set
(by user / by use case)

Data Integration

- Integration Engine
- Web Services
- Direct Integration
- APIs
- Direct Secure Messaging
- FTP

Data Services

- Identity Resolution
- Data Transform
- Access Controls
- Consent/ Authorization
- Data Segmentation
- Data Translation

Care Coordination

- Program Enrollment
- 360 View
- Care Planning & Coordination
- Alerts & Notifications

Referral Mgmt / Closed Loop Referral

- Referral Generation
- Referral Tracking
- Provider Service Directory

Analytics & Reporting

- Analytics
- Reporting
- Data Warehouse

Security

Data Governance

Care Coordination Activities

1. Person search
2. Create a new case
3. Enroll person in program
4. Perform guided interview and assessment
5. Establish muti-disciplinary team
6. Create/edit care plan
7. Create / send / receive referral
8. Manage client care plan
9. Access cross program data (360 degree view)
10. Create reports and analytics
11. Capture consent

Access to data and/or services

Legend

Blue - County
Gray - Community-based Organization
Red Outline - HIPAA Organization

DATA EXCHANGE FRAMEWORK

Description of Figure on Prior Slide

The model depicts the data sources, data consumers and capabilities required for care coordination across health and social care. Data sources include; CalSAWS, WIC, Public Health, Behavioral Health, Clinic HER, Justice systems, EMS, Housing CoCs, Community Based Organizations, Behavioral Health providers, Health Plans, and Hospitals and providers.

Capabilities include; Data Integration services; Integration Engine, Web Services, Direct integration, APIs, Direct Secure Messaging, and FTPs. Data Services such as Identity Resolution, Data Transformation, Access Controls, Consent/ Authorization, Data Segmentation and Data Translation. Care Coordination capabilities include; Program Enrollment, Care Planning & Coordination, 360 View, and Alerts & Notification. Data Analytics and Reporting services including data warehouse. Referral Management services include; Referral Generation, Referral Tracking, and Provider Directory. Underlying the capabilities is Security and Data Governance.

Care Coordination Activities supported by the capabilities include: person search, create a new case, enroll person in program, perform guided interview and assessment, establish muti-disciplinary team, create/edit care plan, create / send / receive referral, manage client care plan, access cross program data (360 degree view), create reports and analytics, capture consent.

Data Consumers include; Community Based Organizations, Behavioral Health Providers, Healthcare Providers, Agency workers, Payers, Emergency Services, QHIO, and Non-QHIO Intermediaries.

Reference Architecture Legend

Category	Functionality	Description	System Type	Scope	Data Standards	Comments
Data Source	CalSAWS (Statewide Automated Welfare System)	Eligibility and enrollment information for social programs; Cal-Med, CalFRESH, CalWORKS, Foster Care, Child Care	Case Mgmt	State system, county implementation	Based on reporting requirements for CMS, ACF, USDA.	Data sets will be consistent across the state
Data Source	WICWise (Supplemental Nutrition for Women, Infants and Children)	Supplemental Nutrition Program for Women Infants and Children	Case Mgmt	State system, county implementation	Based on reporting requirements for FNS	Data sets will be consistent across the state
Data Source	Public Health	Local Public Health Programs - surveillance, community health workers	EHR / Case Mgmt / other	County systems	Based on reporting requirements of CDC	Multiple public health systems/programs
Data Source	Justice	EHR, Intake Management Systems, other	EHR / Case Mgmt / other	County systems	CJIS	Multiple systems; jail intake systems, EHR,…
Data Source	Clinic - EHR'	County Clinics	EHR	County systems	HL7	Epic and Cerner are commonly used across counties
Data Source	Behavioral Health	County Behavioral Health Providers / Programs	EHR and Case Management	County systems	HL8	Standard is Streamline SmartCare via MHSA
Data Source	Housing CoCs	Homeless Information Management System (HMIS)	HMIS	Based on local CoC (Housing Continuum of Care)	HUD data set	Five HMIS vendors in CA with Bitfocus and WellSky being the most common
Data Source	Community Based Organizations (CBOs)	County contracted and noncontracted organizations supporting care	Varies	Local NPOs	N/A	N/A
Data Source	Behavioral Health Providers	Private behavioral health providers supporting the county	EHR	Local NPOs	N/A	N/A
Data Source	Health Plans	Health plans supporting the county	EHR	Local NPOs	N/A	N/A
Data Source	Hospitals & Providers	Private hospitals and providers supporting the county	EHR	Local NPOs	N/A	N/A

Category	Functionality	Description	System Type	Scope	Data Standards	Comments
Data Integration	Integration Engine	Software that provides a standard means of exchanging data between systems - enables the movement and cleaning of data.	N/A	N/A	N/A	Includes Informatica, Redox, CorePoint, Rhapsody
Data Integration	Web Services	Discrete code to process disparate data	N/A	N/A	N/A	N/A
Data Integration	Direct Messaging	Standard for exchanging data in a secure network	N/A	N/A	N/A	N/A
Data Integration	APIs (application programming interface)	A connection between systems for data exchange	N/A	N/A	N/A	N/A
Data Integration	Database Connections	Direct integration of data	N/A	N/A	N/A	N/A
Data Integration	FTP (file transfer protocol)	Standard communication protocol for file exchange	N/A	N/A	N/A	N/A
Data Integration	Other	as needed by the jurisdiction	N/A	N/A	N/A	N/A
Data Services	Identity Resolution	Resolves identity across diverse systems and or records	N/A	N/A	N/A	N/A
Data Services	Data Transformation	Normalizing data to enable exchange and reporting	N/A	N/A	N/A	N/A
Data Services	Access Controls	Manages the data available to a user based on role, organization and consent	N/A	N/A	N/A	N/A
Data Services	Consent /Authorization	Stores a patient/clients' decisions regarding capturing and sharing of protected data	N/A	N/A	N/A	N/A
Data Services	Data Segmentation	Partitioning data into logical parts based on policies to accurately apply consent	N/A	N/A	N/A	N/A
Data Services	Data Translation	Includes terminology services and / or mapping data for meaning across domains	N/A	N/A	N/A	N/A
Analytics & Reporting	Analytics	Supports systematic analysis of data for statistics, interpretation and discovery	N/A	N/A	N/A	N/A
Analytics & Reporting	Reporting	Adhoc and standard reports	N/A	N/A	N/A	N/A
Analytics & Reporting	Data Marts	Subset of data warehouses	N/A	N/A	N/A	N/A
Analytics & Reporting	Data Warehouse	Centralized data repository	N/A	N/A	N/A	Data warehouse is necessary for reporting, but does not need to persist to be viewed.

Category	Functionality	Description	System Type	Scope	Data Standards	Comments
Referral Mgmt / Closed Loop Referral	Referral Generation	Creation of electronic referral	N/A	N/A	N/A	Guidance provided by DHCS
Referral Mgmt / Closed Loop Referral	Referral Tracking	Management of referral from generation to closure	N/A	N/A	N/A	Guidance provided by DHCS
Referral Mgmt / Closed Loop Referral	Provider Directory	Registry or listing of service providers, may be from 211, Unite Us, or FindHelp	N/A	N/A	N/A	Guidance provided by DHCS
Care Coordination	Program Enrollment	Supports the enrollment and disenrollment of a patient/client to a program, such as CalFresh, ECM or a program specific to a CBO or POF like Stepping Up. Maintains a record of program participation.	N/A	N/A	N/A	Program enrollment is used to identify care team members for the multidisciplinary care team and confirm participation for patient/client.
Care Coordination	Care Planning & Coordination	Enables scalable collaboration across multidisciplinary team	N/A	N/A	N/A	Supports multidisciplinary teams with assessments, care plans and/or collaboration tools. Specific capabilities will vary across jurisdictions.
Care Coordination	360 View	Longitudinal view of the client/patient across systems	N/A	N/A	N/A	Data visible to users is based on access controls and patient/client consent. Not all data will fall under HIPAA TPO. Users will typicall have access to limited data based on their role.
Care Coordination	Alerts & Notifications	Electronic communication of information, typically information requiring action	N/A	N/A	N/A	Ability for care team to subscribe to alerts and notifications.
Security	Security	Protects applications, services and data from unauthorized access or use.	N/A	N/A	N/A	N/A
Data Governance	Data Governance	Policies, roles, and standards to manage and safeguard data assets, including how data can be used.	N/A	N/A	N/A	N/A

Category	Functionality	Description	System Type	Scope	Data Standards	Comments
Care Coordination Activities	Person Search	Look up a client/patient in the system	N/A	N/A	N/A	N/A
Care Coordination Activities	Create a new person	Add a new patient/client to the system	N/A	N/A	N/A	N/A
Care Coordination Activities	Enroll a person in a program	Add a new program to a patient/client record	N/A	N/A	N/A	N/A
Care Coordination Activities	Perform guided interview and assessment	Structured process for capturing patient/client information	N/A	N/A	N/A	N/A
Care Coordination Activities	Establish multi-disciplinary team	Create an association between care providers from different programs and or organizations	N/A	N/A	N/A	N/A
Care Coordination Activities	Complete assessment	Collect patient/client information to understand their needs	N/A	N/A	N/A	N/A
Care Coordination Activities	Create / send / receive referral	Management of referrals for services identified via interview or assessments	N/A	N/A	N/A	N/A
Care Coordination Activities	Manage client care plan	Plan of activities and services based on the client/patient's needs and goals	N/A	N/A	N/A	N/A
Care Coordination Activities	Access cross program data (360 view)	Complete view of the patient /client	N/A	N/A	N/A	N/A
Care Coordination Activities	Create reports and analytics	Analytics or visual representation of information, trends or statistics	N/A	N/A	N/A	N/A
Care Coordination Activities	Capture consent	Patient/client's determination regarding data accessible to care providers	N/A	N/A	N/A	N/A