San Francisco Whole Person Care Strategy and Planning Services

Requirements Input to RFP
Future State Solution Vision

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Gartner

Table of Contents

Separate Appendices and Attachments

List of Tables

No table of figures entries found.

List of Figures

1.0 Introduction

This document provides content that is ready for insertion into the City of San Francisco's Request for Proposal for the procurement of a Whole Person Care Platform. This document is intended to give potential WPC Platform Vendors broad context and understanding about what DPH seeks to procure.

The primary sections of this document include:

- ***WPC Program Background*** – Relevant background on the overall WPC Program and context on the City's implementation of the WPC Program
- ***WPC Program Vision*** – Information about what the WPC Program is seeking to achieve and what programmatic success looks like for WPC
- ***WPC Business Capabilities Vision*** – Information about the intended users of the WPC Platform and the Business Capabilities that they will require to conduct their work
- ***WPC Platform Technical Vision and Guidelines*** – Information about the Technical Vision for the WPC Platform including: Application Foundation, Master Data Management and Data Aggregation, Interface for Accessing WPC Data, Integration / Interoperability, Case / Care Management, and User Identity Management and Access Controls
- ***WPC Solution Architecture Vision*** – Information about the required solution pattern envisioned for the WPC Platform
- ***Implementation Vision and Guidelines*** – Information about the implementation vision for the WPC Platform including definition of the implementation Phases
- ***Operational Vision and Guidelines*** – Information about the operational vision for the WPC Platform including: System Operations, Help Desk and Issue Resolution, and Enhancements and Solution Expansion

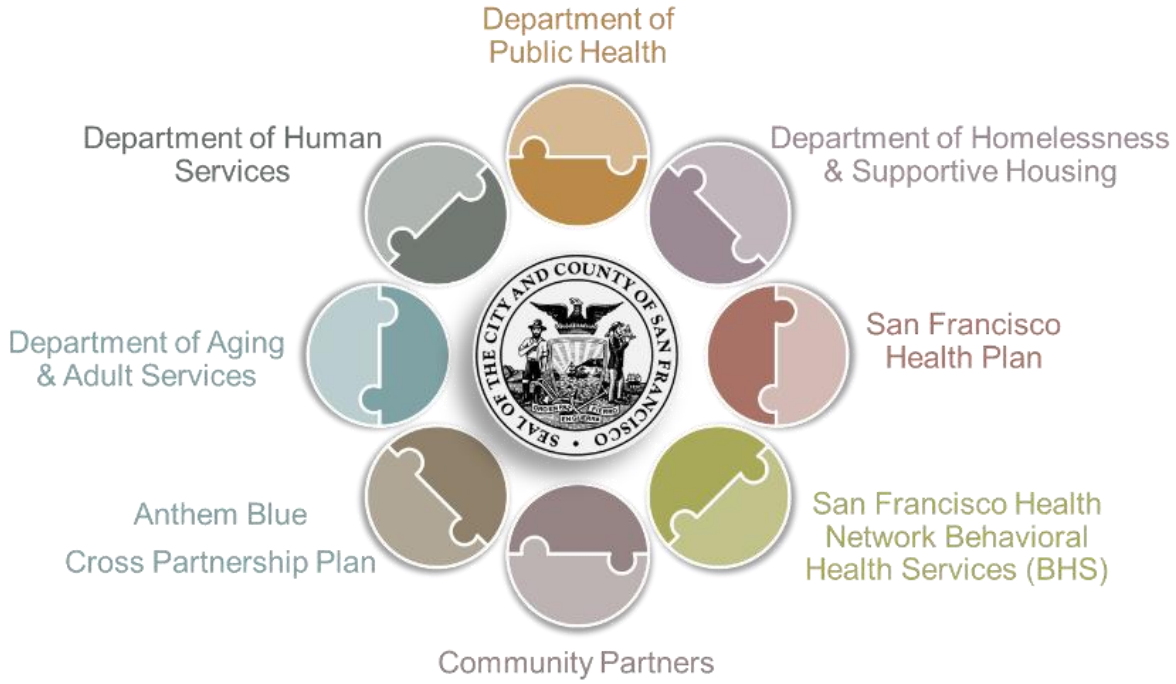
Each section in this document references additional separate documents that are intended to give potential WPC Platform Vendors detailed requirements about what DPH seeks to procure along with a uniform format in which to provide their responses to DPH.

2.0 WPC Program Background

The City of San Francisco (the City) is a participant in the Whole Person Care (WPC) Pilot Program managed by the California Department of Health Care Services (DHCS) under the Medi-Cal 2020 waiver.

As stated by DHCS, "The overarching goal of the Whole Person Care (WPC) Pilots is the coordination of health, behavioral health, and social services, as applicable, in a patient-centered manner with the goals of improved beneficiary health and wellbeing through more efficient and effective use of resources. WPC Pilots will … receive support to integrate care for a particularly vulnerable group of Medi-Cal beneficiaries who have been identified as high users of multiple systems and continue to have poor health outcomes. … WPC Pilot entities will identify target populations, share data between systems, coordinate care real time, and evaluate individual and population progress – all with the goal of providing comprehensive coordinated care for the beneficiary resulting in better health outcomes." (http://www.dhcs.ca.gov/services/Pages/WholePersonCarePilots.aspx)

The City's Pilot is co-led by the Department of Health (DPH) and the Department of Homelessness and Supportive Housing (HSH) and will be delivered in coordination with additional departments, service providers, and community partners who are experienced with and passionate about providing better care for San Francisco's vulnerable populations.



Although DHCS reimburses the City only for those individuals who are covered by SF County Medi-Cal, the City's WPC Pilot target population is made up of all homeless adults regardless of their insurance coverage, with a special focus on those who are high utilizers of health urgent / emergent services. In 2017, DPH's stratification of this population identified an anticipated total of 16,954 unduplicated persons who would be serviced by the WPC Pilot over the life of the program with a total of 10,856 persons served in each given year after accounting for attrition and new persons served each year.

While the WPC Pilot is a new program for the City, its intended strategies have been employed in San Francisco for decades. SF has previously developed and currently utilizes a Coordinated Care Management System (CCMS) in support of City-wide care coordination efforts for its most vulnerable adult patient populations. CCMS has been the main technology platform for integrated health and social determinants data, data sharing, risk assessment, and population risk-stratification. CCMS integrates and aggregates clients' medical, behavioral, housing, and social data from multiple data source systems that do not otherwise share information. CCMS makes that comprehensive client summary data available to the various care delivery teams in their source systems and enables San Francisco to better understand its most vulnerable populations. Begun in 2005, CCMS has evolved to become a nationwide leading vision for how to better support coordinated care for complex, high risk, and vulnerable clients. Invaluable learnings from developing and utilizing this integrated data system have informed the approaches and requirements for the future WPC platform.

Although CCMS has demonstrated the value of aggregating client data both longitudinally and across different domains of care and systems, it has also demonstrated the difficulty of ensuring that the data is consistently complete, accurate, accessible, and actionable.

The City is looking to leverage WPC funding to close existing service and care coordination gaps, to provide comprehensive client-centric services by using existing programs and staff more efficiently and effectively, and to develop a modern and comprehensive technology platform that can replace CCMS and ultimately be utilized to coordinate care across agencies for all vulnerable people in San Francisco.

3.0 WPC Program Vision

The City's vision is to transform San Francisco's response to homelessness into a comprehensive, seamless and human-centric system of care in which homelessness is rare, brief and one-time, and the most vulnerable receive care that helps them lead healthier lives.

The City envisions long-term outcomes for Clients, Staff, and the Public:

- ***Difference for Clients*** – Improved well-being, reduced crisis events, and increased ability to sustain stable housing through receiving the right care at the right place at the right time
- ***Difference for Staff*** – Reduced reactive care and increased ability to appropriately and accurately prioritize and respond to client's needs through comprehensive real-time data access and decision support
- ***Difference for the Public*** – Decreased long-term homelessness, expanded compassionate solution to suffering, reduced reliance on San Francisco's General Fund and more directed and effective utilization of public benefits.

While the initial scope of the City's WPC Pilot Project is necessarily limited to funding services and infrastructure development for a defined target population (adults experiencing homelessness), the City's overall WPC program vision is much more expansive. The City ultimately envisions a sustainable, "any door is the right door" approach to providing long-term coordinated care across a full ecosystem of continually innovated services for *all* vulnerable people in San Francisco served by the safety net:

- ***Sustainable*** – Programmatic, clinical, data integration and infrastructure investments and efforts will be designed for sustainability from cost, staffing, effort, and other resource perspectives. The City requires the WPC platform to provide reimbursement and invoice support documentation in support of cost sustainability and other operational reporting in support of resource efficiency efforts. The City also requires the WPC platform to be sustainable from an iterative design and configuration perspective.
- ***Any door is the right door approach*** – Regardless of when, where, and how Clients initially engage with WPC, Clients will receive coordinated access to the appropriate service(s). The City requires the WPC platform to provide access to Care Coordinators wherever they meet clients including offline and in the field.
- ***Coordinated care follows the client*** – Care will be coordinated, provided, and monitored longitudinally, potentially across the full span of a Client's long-term care, rather than a Client's episodic service needs. This needed care coordination will prevent San Francisco's most vulnerable clients from falling out of touch or getting stuck in a cycle of requiring expensive urgent/emergent services. The City requires the WPC platform to provide longitudinal oversight and insight into client needs, services, and other data regardless of point-in-time eligibility, enrollment, or other engagement status.
- ***Ecosystem of continually innovated services*** – SF will continue to innovate and optimize its service offerings and service delivery model for its most vulnerable populations. The entire ecosystem of services – regardless of who is providing the service, what agency is administering the service, and how the service is funded – will be available to WPC clients. The City envisions WPC as the "connective tissue" between these services. The City requires the WPC platform to flexibly and efficiently absorb and adapt to changes in services and service models.

- ***All vulnerable people in San Francisco*** – The City intends to provide coordinated services to all people in San Francisco who are shared between City agencies. This vision extends beyond the initial target population of homeless adults to San Francisco children, families, and youth, and housed adults served by the City's safety net regardless of insurance status. The City requires the WPC platform to meet the Client tracking needs across these different Client populations.

The City envisions continuing to lead at the cutting edge of innovative care coordination service design and technology while also providing a seamless, human-centric, and dignified experience for Clients and requires a system that can respond to program innovations and iterative/ continuous quality improvements

The City's WPC Strategic Aspirations are as follows:

	WPC Strategic Aspirations
	Improve outcomes, fill gaps and reduce rework by increasing integration among county agencies, health plans, and providers and by developing infrastructure to ensure sustainability in the long term
	Increased access and utilization of services by increasing care coordination and appropriate access to care for the most vulnerable Medi-Cal beneficiaries
	Reduce inappropriate utilization of emergency services through the establishment of comprehensive care plans and programs such as permanent supportive housing and transitional primary care services
	Define and achieve targeted quality and administrative improvement benchmarks that focus on improving health outcomes and paying for improvements in health status rather than for services provided
	Establish capabilities to monitor and measure the success rate of different approaches and the capabilities to evolve and improve
	Achieve the broader goal of citywide inter-agency data sharing that improves collaborations and helps the City gain broader insights

4.0 WPC Business Capabilities Vision

The City envisions that WPC Clients will interact with an ecosystem of different department staff, service providers, and community partners over the course of engaging with and receiving services from WPC. These individuals will have varying responsibilities for Client care and will use multiple technical platforms to support their care management responsibilities. Currently, records documenting Client services across the array of health and social service programs and agencies are created and stored in systems that do not talk to each other. As a result, clients fall through the cracks between episodes of care, repeatedly start and duplicate assessments and care plans, and histories are only partially known.

The City requires the ability to share strategic and pertinent information about these clients serviced by multiple departments and agencies between members of the various teams who serve them. This need is particularly acute for the most vulnerable clients served. The City envisions a solutions where disparate records for a single person are matched and relevant information from each is integrated into a single record on the WPC platform that is accessible to all members of the treatment team. The integration of key data from the numerous medical and social services data sets will enable San Francisco to understand the whole person, to stratify risk utilizing information from multiple domains, to enable care coordination, to improve the service experience for both clients and providers, and to improve health outcomes.

The primary users of the WPC platform and WPC platform data are:

- ***Care Coordination Team Members*** – Responsible for tracking and coordinating care for individually assigned clients and caseloads across all systems of care (e.g., departments, programs, etc.) and longitudinally across the client's long-term care regardless of episodic care needs.
- ***Supervisors*** – Responsible for overseeing Teams as well as configuring client records, assessments, care plans, care teams, referrals, authorizations, services, and other components on the WPC platform for use by Care Teams.
- ***Population Health / Analytics / Data Reporters*** – Consumers of aggregated WPC data for multiple analysis and reporting purposes including: care coordination, panel and caseload management, operational reporting and analytics, performance reporting and analytics, reimbursement / invoice support, population health management, and research. Primary users of the aggregated data contained within the WPC platform.
- ***Service Providers*** – Consumers of integrated WPC data for the purpose of being fully informed about a WPC client when delivering specific services to WPC clients.

Business capabilities enable various WPC end users to effectively carry out their tasks and activities, including:

- Point of Service — Providers delivering care to an individual
- Panel Management — Providers, panel analysts, and clinic directors planning and preparing to care for clients in caseloads or panels
- Population Health — Administrators and researchers using vulnerable populations data for program and system evaluation
- Invoicing and Reimbursement — Program administrators preparing financial reports

- Data Sharing and Aggregation — Care Teams utilizing consolidated medical, behavioral, housing, substance use, and social data from various data sources across the WPC ecosystem to better serve SF's vulnerable populations

The business capabilities required by users of the WPC platform are as follows:

#	Business Capability	Description
1	**Client Case Management**	This business capability allows users to coordinate a Client's multiple assessments, needs, services, progress, referrals, linkages (actually connected) and outcomes as a cohesive case.
2	**Shared Client Record and Client Information**	This business capability allows users to update and manage a Shared Client Record and associated Client Information.
3	**Shared Needs Assessment**	This business capability allows users to define, conduct, and utilize a shared needs assessment to understand Client risk level. Ability to determine a dynamic Client risk score and relative priority based on Client assessment. Ability to overwrite/correct/update prior or auto-calculated risks that might affect score.
4	**Shared Care Team**	This business capability allows users to view and manage a Client's Care Team membership and associated information including: Care Team role, relationship to Client, contact information, and relevant notes.
5	**Shared Client Care Plan / Action Plan**	This business capability allows users to create, document, monitor, update, and manage a Shared Client Action Plan of goals, actions, milestones, and services to help Clients reach their target outcomes.
6	**City-wide Service Linkage Management and Tracking**	This business capability allows users to manage linkages to services including: forwarding, assigning, and closing out linkages and the ability for appropriate users to check on linkage status and activities.
7	**Client Data Sharing and Other Authorizations**	This business capability allows users to store and manage relevant authorizations including advanced directives and Client data sharing, as well as have the system provide notifications when releases are about to expire. System closes access to protected information once release expires. Exception for "break the glass" ability for emergency providers (ED/EMS/PES/etc.) to read SUD records protected by 42cfr2 if/when a patient presents and circumstance is allowed by regulations.
8	**Client Panel Management**	This business capability allows users to utilize reports regarding platform data, evidence-based prompts, and

#	Business Capability	Description
		preconfigured criteria for panel management activities including: prioritizing Clients, actions, and interventions.
9	**Client Registry Management**	This business capability allows users to define and manage a set of Clients segmented by preconfigured or by selected variable criteria, such as health conditions, demographics, or other shared Client characteristics.
10	**Alerts and Communications**	This business capability allows users to send, receive, and view alerts and notifications necessary for Care Coordination including: reminders, incident notifications, transition of care notifications, and messages.
11	**Workforce Management**	This business capability allows users to manage the workforce including designating supervisor / supervisee relationships and defining required approval pathways for different work items.
12	**Client Encounter Documentation**	This business capability allows users to document and track details of encounters with or on behalf of Client's including details of care provided and attempts to provide care. This Use Case allows for documentation in both structured and unstructured formats.
13	**Shared Information outside of WPC Platform**	This business capability allows users to view aggregated information (as appropriate according to their role and workgroup assignment) from the WPC platform while in their Source Data Platform.
14	**Reporting and Analysis**	This business capability allows users to use a variety of reporting and analytical tools to provide insight into WPC data for a variety of purposes including: ability to research, align and forecast objectives, capture and measure outcomes, retroactively track and report actions, assess performance against success metrics, track and report on requisite metrics, and generate invoice and reimbursement supporting documentation. Additionally, this Use Case allows users to capture, measure, and analyze performance on individual and aggregated outcomes of target populations.

The detailed WPC platform functional scope is fully outlined in the use cases and functional requirements (see Functional Requirements Appendix 2).

5.0 WPC Platform Technical Vision and Guidelines

The WPC vision calls for establishing a City-wide client centric platform (from now on referred to as the "WPC Platform" or "WPC Solution") to coordinate the efforts of different City departments, programs and service providers with the goals to:

- Have a common view of clients and their needs to better coordinate care
- Establish a shared client action plan to ensure that all departments, programs and service providers have a common understanding of the services to be provided for an individual client
- Provide the capability to track provided services and clients progress towards their goals
- Minimize redundancies and improve the City's efficiency and effectiveness in delivering services

While services provided by various City departments and providers will continue to be supported by their own native IT systems (e.g. DPH's use of Epic, HSH's use of ONE…etc.) the WPC Platform will provide an additional system and a set of services and capabilities to increase sharing of data and collaboration among care teams.

To achieve the WPC vision, the WPC program leadership has established a high-level enterprise architecture vision that will guide the design and implementation of the future WPC Platform. This vision covers application architecture, data flow and data aggregation, system and data access, integration with external IT systems, case management and user identity and access controls.

The following subsections provide an overview of that vision and are intended to provide the stakeholders with insights and better understanding of the envisioned future state. The vision is not intended to tell Vendors ***how*** to design the systems but rather to communicate ***what*** should be considered when designing and developing the WPC Platform.

The WPC Platform Technical Vision is organized into 6 different perspectives as follows:

- Application Foundation
- Master Data Management and Data Aggregation
- Interface for Accessing WPC Data
- Integration / Interoperability
- Case / Care Management
- User Identity Management and Access Controls

5.1 Application Foundation Vision

1. The WPC team recognizes that the technology solution will continue to evolve as the WPC program further develops and matures, new methods of practice and technologies emerge. It is the vision that the ***WPC Platform capabilities will be structured in logical layers*** where capabilities in each layer can evolve at different speeds / pace of chance (for more details see Pace of Change Layers Architecture View under section 6.3)
2. The WPC Platform shall be based on ***proven Commercial Off-The-Shelf (COTS) solution components*** that can be configured or customized to meet WPC needs

3. It is envisioned that the WPC Platform be built around a framework that allows ***adoption and refinement of capabilities over time*** (e.g. ability to add new services and assessments as needed by the business)
4. The WPC Platform shall ***enable future agility*** using best practices such as decoupling the various technical modules (for more details see Application Technical Capabilities Architecture View under section 6.2)
5. The WPC Platform shall consider the use of modern browser technologies that ***support multiple devices with different form factors*** *such as "responsive design"*
6. It's envisioned that the WPC Platform provide a ***standard set of tools for integration*** with source data systems such as DPH's Epic, HSH's ONE system and other City applications
7. The WPC Platform shall leverage DPH's data warehouse and analytic capabilities that are ***separate from the core application*** and enable the use of existing analytics tools currently available within the City
8. The WPC Platform infrastructure design shall be ***scalable to keep pace with the growth*** and addition of various client cohorts served by the WPC program and beyond
9. DPH envisions that the WPC Platform will be ***implemented as a Software as a Service (SaaS) or hosted solution*** that is in compliance with U.S. public sector hosting requirements
10. It is envisioned that the WPC Platform can be supported and built using a development Platform with robust automated testing and release management tools to ***allow incremental release of functionality*** to both browser-based and mobile devices

5.2 Master Data Management and Data Aggregation

1. The WPC Platform is envisioned to be an aggregation point of WPC related data. That is, it shall ***aggregate the data from the different care providers' systems*** to create a 360 degree client centric view of the services provided to the client throughout the City
2. The City is deploying an ***Enterprise Master Patient Index (eMPI) for matching patient identities across multiple systems***, it is the envisioned that the WPC Platform will leverage this functionality. The other WPC related systems such as EPIC, Avatar, ONE & etc. will be integrated with the eMPI. Additional master data management considerations will be in harmony with DPH's Data Warehouse / Information Management strategy (e.g. Using DPH's EDW platform MDM capabilities)
3. The WPC program leadership understands that WPC cannot control data quality and address data quality issues caused by other programs within their source systems. The WPC data aggregation system shall flag data quality issues based on predefined data cleansing rules and enable data correction by sending data error reports to designated data stewards before importing data into the WPC Platform; however, the ***ultimate responsibility for data quality issues lies with the source systems of record*****.** The WPC program team will work with its partners and data providers to establish data management governance agreements and processes to remediate data quality issues

5.3 Interface for Accessing WPC Data

1. The WPC Platform shall provide ***an internet browser-based application to allow care coordinators and providers to view sets of information about their client*** (e.g.

demographics, appointments, plans, status, needs, risk, history, etc.) based on their access rights and client consent:

- The WPC user interface (UI) will provide a standard UI for a consistent user experience across all participating departments, programs and user groups that ***supports multiple platforms and devices***
- It is anticipated and expected that **different views of the WPC data will be displayed based on a combination of factors** including the need-to-know and minimum necessary based upon the role and identity of the user, the treatment context, client data and stored user preferences
- For departments who require an option to provide a seamless experience to their users by mixing various WPC data sets with their own data and display the combined data within their own system screens, WPC will ***provide Application Programmable Interfaces (APIs) to allow service providers to extract WPC client data*** elements and integrate within their own systems
- The WPC Platform will provide mechanisms to ***ensure appropriate API / data sharing security***

2. To increase the likelihood of the WPC Platform adoption by care providers, the ***solution design shall aim to reduce the number of user clicks and accelerate access to WPC information,*** by utilizing human-centric design navigation patterns and enabling technology that allows:
   - Seamless launch of the Web UI from within the native care delivery application through a single click
   - Passing along end user credentials and client information, so that a user does not need to retype it, and automatically retrieving and displaying relevant WPC data
   - Automatically displaying the most appropriate view of the client's data based on a combination of factors, including the type of user, the treatment/system context and/or client WPC data
   - Designing the UI in a manner that reduces the system navigation steps required by end users to view information or trigger actions
   - Allow users to toggle between the WPC UI and their native application screens

5.4 Integration / Interoperability

1. Participating departments and programs, along with their vendor partners, will ***contribute to establishing a central WPC aggregated data repository*** by sharing specific data sets from their own systems
2. The WPC Platform is envisioned to include the necessary infrastructure to capture data from the various source systems across ***multiple clouds and data centers using multiple data integration approaches and support common interoperability standards*** (e.g. APIs, ETL, HL7, etc.)
3. It is envisioned that the established integration technology and processes shall ***allow additional future data sources and consumers to connect to the WPC Platform*** without the need for development rework within the WPC Platform (e.g. Based on configuration and published standards)

4. The WPC Platform shall protect data privacy using best practices such as ***encryption of all data at rest and in transit*** and in accordance with City policy and applicable law and regulations including Health Insurance Portability and Accountability Act (HIPAA)

5.5 Case / Care Management

1. The WPC Platform shall be able to provide case management capabilities for multiple distinct programs and user groups ***each with their own unique set of case management requirements***, ***processes, and workflows***
2. The WPC Platform is envisioned to replace DPH's current data aggregation system, known as Coordinated Care Management System (CCMS), which currently also provides unique case management capabilities to different DPH and HSH user groups. While some of these case management user groups will be migrated to other City IT systems, the WPC Platform shall ***absorb any remaining case management needs and data requiring data conversion activities***
3. All WPC case management user groups shall be able to ***share and access WPC aggregated data and functionality based upon user role-based authorizations.***

5.6 User Identity Management and Access Controls

1. DPH envisions that WPC identity solution shall be ***integrated with the City's Active Directory (AD)*** and other identity stores (e.g. HSH's ONE identity store) to improve security, reduce administrative burden and facilitate single sign-on. For provider staff who are not registered with City's AD, the solution shall provide a process for user administrators to register and grant them appropriate level of access to the WPC Platform (e.g. Contact DPH help deck to get added to DPH's AD with appropriate role and authorization)
2. The WPC Platform shall provide role-based access management that ensures that the various user groups are only granted access to the functions and data within the WPC Platform that they are authorized to view based on a combination of their role and what the client has consented to share

6.0 WPC Solution Architecture Vision

The WPC Solution Architecture defines the required solution pattern envisioned for the WPC Platform. The architecture is described using a number of "architecture views", each with a different emphasis and perspective that helps focus the attention to a particular aspect of the solution. These architecture views are organized into the following subsections:

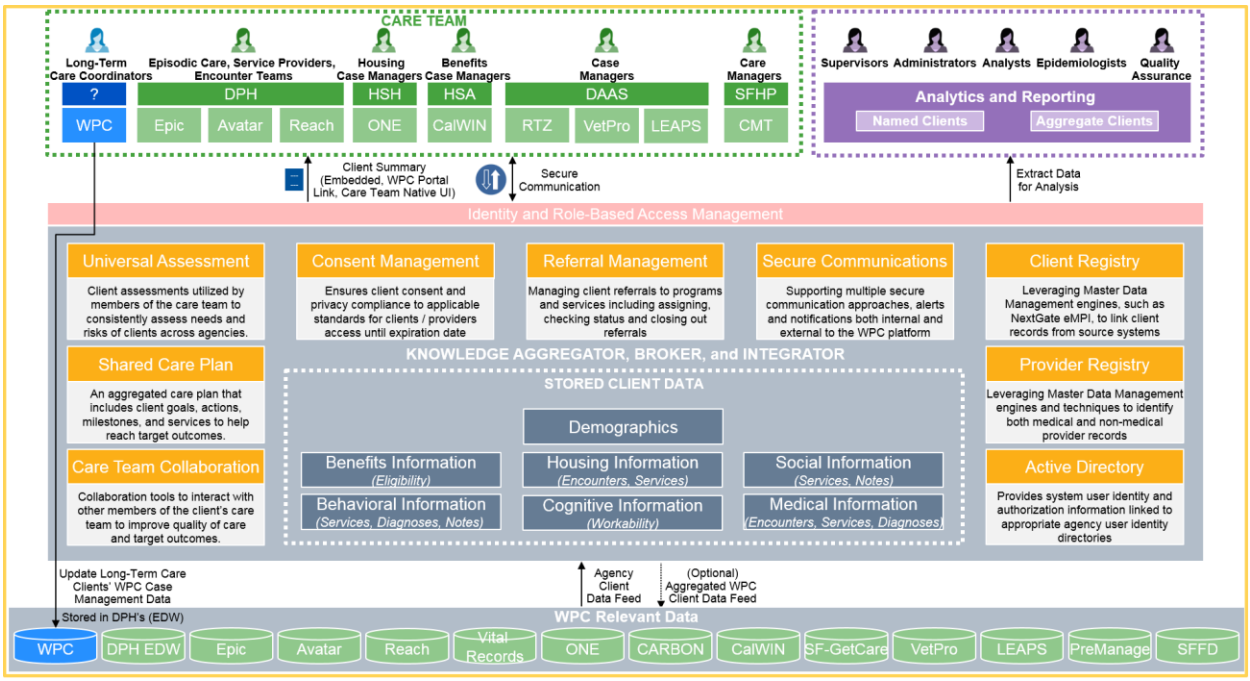
- **Business Stakeholders Conceptual Architecture View**
- **Application Technical Capabilities Architecture View**
- **Pace of Change Layers Architecture View**
- **Enterprise Integration Architecture View**
- **Data Flow Architecture View**
- **Physical Location Architecture View**

The following subsections describe each of architecture views in more detail.

6.1 Business Stakeholders Conceptual Architecture View

The Business Stakeholders Conceptual Architecture View (Figure 1) provides a high-level view of the system and interactions of its key components similar to a “City Plan”. The purpose of the conceptual architecture view is to clarify the scope and the boundaries of the system and help both business and IT resource communicate to ensure a shared understanding of the solution.

Figure 1. Business Stakeholders Conceptual Architecture View



The diagram shows that at the heart of the system is a data aggregator that routinely collects WPC relevant data from various source systems across City departments and programs, identifies and links the data from the various sources using a client registry and a provider registry, then stores the aggregated client data as shown in the center of the diagram.

This data is then made available to the different users shown at the top of the diagram, described further in the WPC Business Capabilities Vision section 4 of this document. The objective is to provide these users with a holistic view of their clients’ data that goes beyond the client data they have available within their own programmatic core systems alone.

Most users will continue to use their own core system to provide care and will gain access to WPC data using a WPC UI link that is embedded in their own core system’s screens, as shown at the top of the diagram in green color. For example, ED clinicians at Zuckerberg San Francisco General Hospital who will use Epic as their core system will be able to click a link within Epic that will open up a WPC UI tab that shows WPC aggregated data for their client and in format, order and manner that is most appropriate for and ED context. Another provider (or the same provider) opening up a WPC link from a different care context might see information formatted and ordered differently.

The data sets that each user is able to access will be based on the user’s role that is controlled using an identity and role-based access management layer that factors in client consent. Each user role will have a WPC data view that is tailored and optimized for their needs.

The primary WPC Platform users will be care team members who are authorized by federal, state and local privacy rules to view protected health information, including health care

providers, social workers, case managers, outreach specialists, case managers, and health workers.

These users may be civil service employees or employees of non-profits who contract with the San Francisco Department of Public Health, the Department of Homelessness and Supportive Housing and the Department of Aging and Adult Services. Also included will be the two health plans including the San Francisco Health Plan and Anthem Blue Cross. Other users, as authorized by law and/or the client, may include benefits case managers in the Department of Human Services (benefits), etc.

In addition to a summary of the integrated health and social service histories, Users will have access to the client's universal client assessment tool and a shared client action plan. Users will also use the system to collaborate with other care team members and providers, exchange secure messages and manage referrals.

A small number of users, such as care coordinators, will have direct access to the WPC case management capabilities through a separate UI depicted at the top of the diagram in blue. These users will be able to make data updates to clients' plans and related data. The data they update will be stored in a separate repository, depicted at the bottom of the diagram in blue, and considered to be one of the data sources for the overall WPC data aggregator. The actual physical implementation of this data repository will be part of DPH's Enterprise Data Warehouse (EDW).

Data analysts of the various departments will have access to WPC aggregated data through WPC built-in reports accessible directly from the WPC UI or through external analytical tools. For example, a DPH data analyst part of the MADI team will be able to use MS Power BI, commonly used by DPH, to gain access to WPC aggregated data in bulk to perform population analytics across clients.

The WPC aggregated data will not be modified as the source systems of that data ***will remain the systems of record*** and any data updates to source data will need to occur within these systems. Source systems that are interested in receiving the aggregated WPC data to add to their own databases will have the option to do so through APIs.

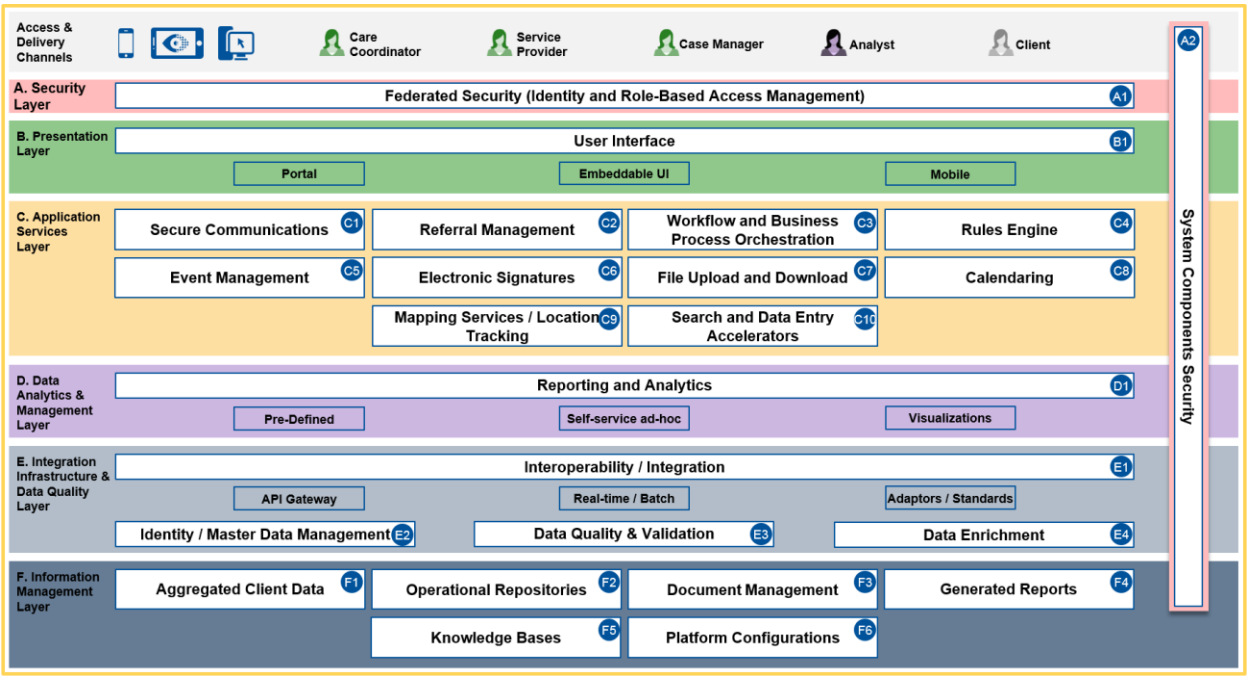
Collaboration with the source system departments, programs and vendors will be critical to the success of the WPC implementation.

For more details see section 1.1 in Appendix 2 - Future State Solution Technical Requirements.

6.2 Application Technical Capabilities Architecture View

The Application Technical Capabilities Architecture View (Figure 2) provides a logical organization of the WPC Platform into layers and enabling technical capabilities allowing the solution to be decomposed into pieces that can each be described at a lower level of detail and designed, implemented and enhanced overtime independently.

Figure 2. Application Technical Capabilities Architecture View



The Application Technical Capabilities Architecture view organizes the technical capabilities required for WPC around the following logical layers of the architecture:

- **A. Security Layer** — this layer is the entry gate for all access and delivery channels, covering Internet, Intranet and various end-user devices and platforms, into the rest of the WPC architecture layers. In addition to traditional perimeter security, all access will require a user to be authenticated and Single Sign-on (SSO) used whenever possible to avoid re-prompting users for credentials. Access to specific functions and data will be based on a role based access control mechanism.
- **B. Presentation Layer** — this layer provides the graphical user interfaces that enable users to access the functions and data of the WPC Platform. User groups include care coordinators, service providers, analysts and clients.
- **C. Application Services Layer** — this layer provides a series of shared services that represent building blocks used to enable the various WPC business capabilities. Example of services include secure communications and referral management.
- **D. Data Analytics & Management Layer** — this layer includes pre-defined reports, self-service ad-hoc reporting and visualization capabilities.
- **E. Integration & Data Quality Layer** — this layer provides the integration and data aggregation infrastructure and services that are needed to connect the WPC Platform to the various source systems (e.g. Epic, ONE). It also provides the capabilities to aggregate data from multiple data sources and sharing of aggregated data back with source systems. This layer provides data quality tools including client master data management to resolve client identities across different source systems. For example, each source system may use different methods for identifying the client. In order to aggregate the data and provide a 360 view of the client, the WPC system must match the different client identities.
- **F. Information Management Layer** — this layer provides the WPC aggregated data store, access to document management repository, service resources repository and knowledge bases.

The capabilities under each layer allow the delivery of required WPC business functionality based on enabling technology best practices. The following examples illustrate the business value of the capabilities identified under the Application Services layer:

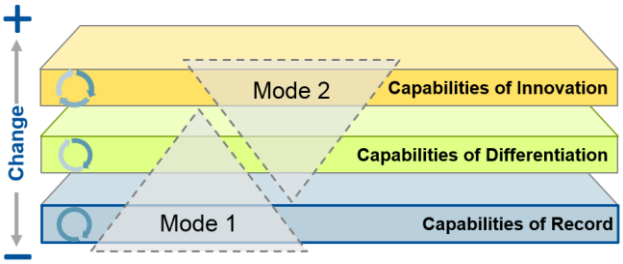
- **Secure Communications** — provides the ability to notify a care coordinator when their designated client checks into a sobering center allowing the coordinator to contact and collaborate with the care team.
- **Workflow and Business Process Orchestration** — allows WPC management team to change sequence of execution of various WPC tasks, e.g. changing the sequence of steps that are required to complete a client assessment without having to depend on application development teams.
- **Rules Engine** — allows WPC program management team to change service eligibility rules or client risk stratification logic without having to depend on application development teams.
- **Event Management** — allows monitoring and notifications of specific events and proactively notifying the care team, e.g. the care coordinator could receive a notification when a client loses Medi-Cal coverage or when he registers with the ED.
- **Electronic Signatures** — allows for capturing client consent electronically to enable quick assistance to a client, for example initiating referrals, while ensuring compliance with privacy laws.
- **File Upload and Download** — allows a client photo to be uploaded and associated to client record for easier identification during team panel discussions or when planning for an upcoming outreach.
- **Calendaring** — allows care team to keep track of their clients' upcoming events such as upcoming client appointments. This will allow the care coordinator to reach out to their clients and check on their needs for transportation to make their appointments.
- **Mapping Services / Location Tracking** — allows automatic recording of the location of client encounters and later viewing of these locations on a map. This will allow an outreach worker to know the client whereabouts and proximity from the current care coordinator location so they can get their more quickly.
- **Search and Data Entry Accelerators** — allows a care coordinator to quickly locate a client record. It is envisioned that the system can provide "fuzzy" search, that is, search and match for names even though the spelling is not exact.

For more details see section 1.2 and section 2 in Appendix 2 - Future State Solution Technical Requirements.

6.3 Pace of Change Layers Architecture View

The capabilities required to support the WPC platform range from ones that are well known and understood to others that need to mature and evolve over time. While these capabilities have different "paces" of change, they must be designed to work together effectively. The City envisions utilizing a Pace layering approach to overcome a "one size fits all" development mentality by classifying the various capabilities into the following categories:

- ***Capabilities of Innovation*** are those that require the highest level of change and uniqueness
- ***Capabilities of Differentiation*** focus on enabling medium level change and complexity



- ***Capabilities of Record*** focus on operational efficiency / consistent change cycles that are not expected to change very often

The goal of utilizing a pace layering approach is to promote agility by recognizing that capabilities in the innovation layer are likely to change more frequently and that the development of these capabilities can follow an agile methodology and allow for experimentations. It is envisioned that Vendors will assist the WPC program in developing approaches that will leverage newer technologies to bring innovation quickly to the production (e.g. RideAlong for developing iterative human-centric street encounters). In contrast, the capabilities of record, and to a lesser extent the capabilities of differentiation, are more stable and require much higher knowledge and up-front efforts when it comes to design and architecture. The components and sub-systems that provide capabilities in these two layers are expected to be proven solutions which are intended to last for a longer period of time and require less change.

The City envisions that Vendors will assist the WPC program in maximizing overall platform agility by utilizing different development approaches for Capabilities of Innovation, Capabilities of Differentiation, and Capabilities of Record to enable the requisite level of change required for each capability.

WPC Capabilities are categorized in the following Application Technical Capabilities Architecture View (Figure 3) and Business Capabilities Pace of Change Layers Architecture View (Figure 4).

Figure 3. Technical Capabilities Pace of Change Layers Architecture View

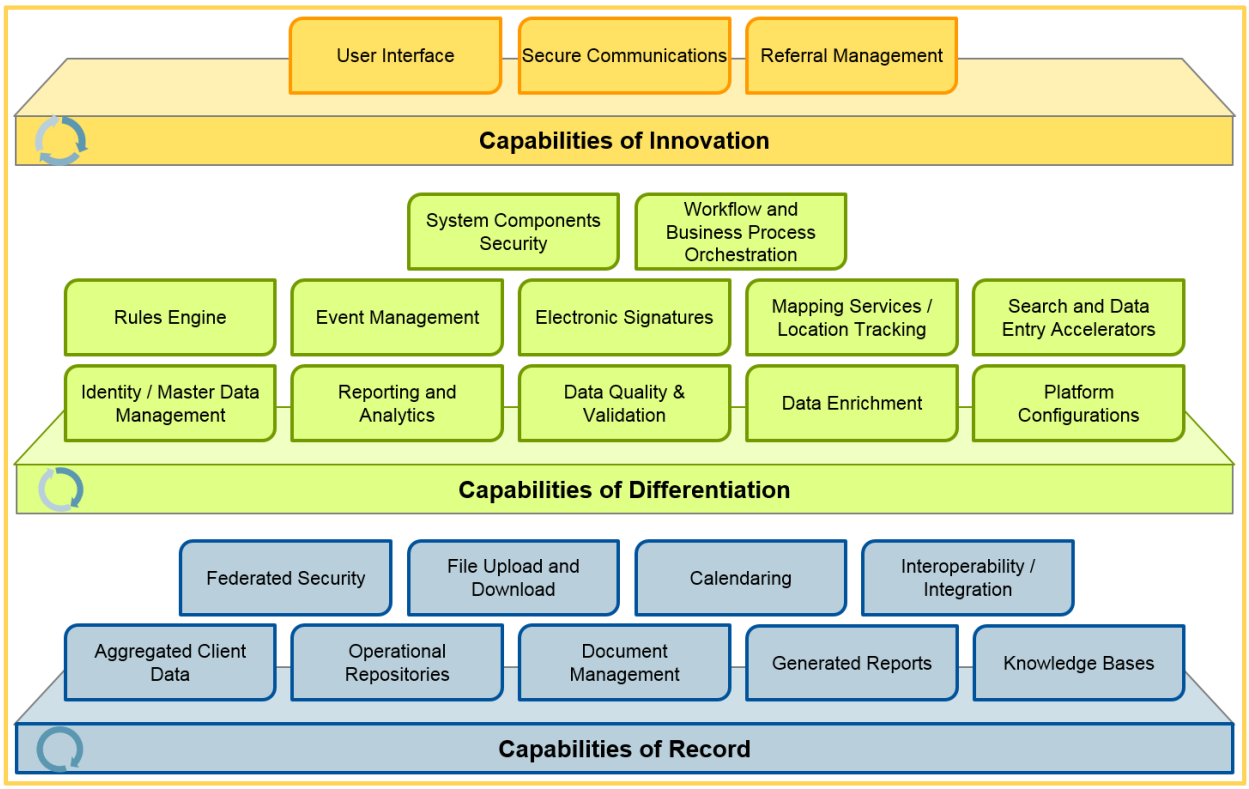
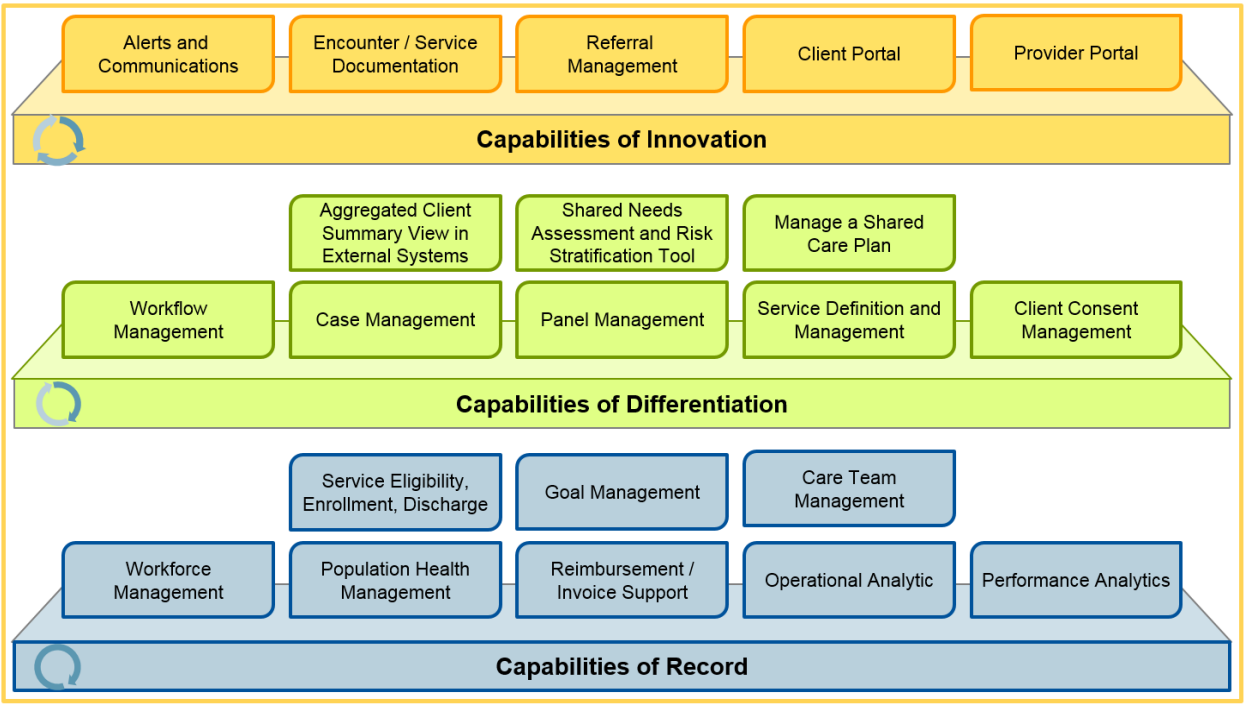


Figure 4. Business Capabilities Pace of Change Layers Architecture View



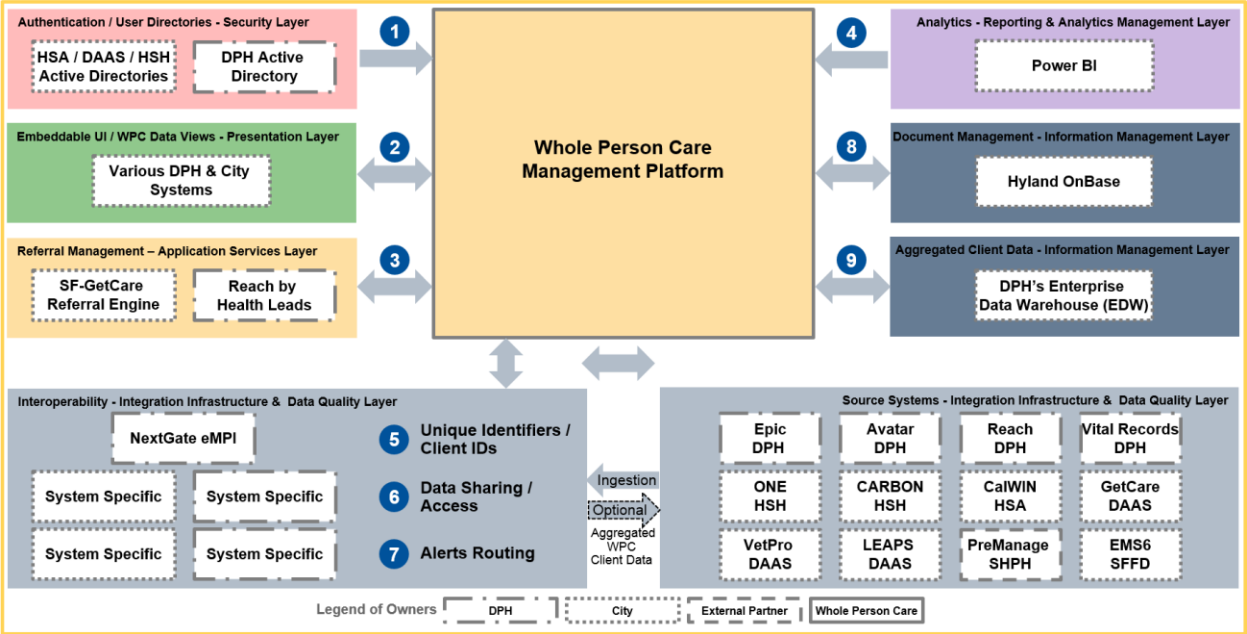
For more details see section 1.3 in Appendix 2 - Future State Solution Technical Requirements.

6.4 Enterprise Integration Architecture View

The Enterprise Integration Architecture View (Figure 5) provides the linkage between the core WPC Platform and the various components of external IT systems.

The integration architecture shows how the WPC Platform depends on external systems. It provides a view of the required complexity, effort and collaboration that will be required to implement the WPC Platform.

Figure 5. Enterprise Integration Architecture View



To minimize redevelopment, redundant work, and duplicate data entry, the WPC Platform will leverage and integrate with various City and State systems (listed under section 1.4 in Appendix 2 - Future State Solution Technical Requirements document) including:

- DPH and City IT platforms that provide user authentication, client / provider identity, referral management, analytics and document management
- City systems (e.g. Epic, Avatar, ONE)
- External systems such as those operated by the State (e.g. CalWIN) or non-City partners (e.g. SFHP's PreManage)

The diagram shows the core WPC Platform at the center interacting with various components of external IT systems used across the City. These external systems will deliver certain capabilities identified in the Application Technical Capabilities Architecture View (Figure 2). Each integration is highlighted using the same color coding depicting the various logical layers in Figure 2 and assigned an external integration identification number as follows:

1. **Authentication** — shows the use and potential integration of various existing City MS Active Directories (AD) required for authentication of WPC Platform users. For example, a DPH Nurse Practitioner will have a record in DPH's AD which the WPC Platform will integrate with to identify her accordingly.
2. **Embeddable UI** — shows various City systems that must consume and display WPC data to provide a seamless user experience and encourage WPC system adoption. For example, an ED Social Worker that uses Epic as their core system will be able to click a link within Epic to open up a WPC UI tab to access WPC aggregated data for their client.
3. **Referral Management** — shows the use of Reach and SF-GetCare as potential referral engines for WPC with capabilities that are already in use at various City locations.
4. **Analytics** — shows the use of MS Power BI which is commonly used by data analysts across the City. The use of existing analytics tools is proposed to reduce cost and minimize the need for learning new tools.

5. **Unique Identifiers** — shows the use of NextGate eMPI for uniquely identifying client and provider records across City department systems to increased data sharing accuracy and build a 360 view of the client.
6. **Data Sharing / Access** — shows the ingestion of WPC relevant data from various source systems across the City and option to send the aggregated WPC client data back to interested systems.
7. **Event Alert Routing** — shows the interaction between various City systems' notification engines to route messages and enhance collaboration between care team members. For example, a Housing Transition Specialists might receive a notification within the HSH ONE system from an HSA eligibility workers indicating that their housing client has an upcoming benefits intake appointment.
8. **Document Management** — shows the use of Hyland OnBase platform used across the City to store documents.
9. **Aggregated Client Data** — shows the use of DPH's Enterprise Data Warehouse (EDW) to store aggregated client data from all source systems plus all other WPC client data that is not copied from the other source systems (e.g., derived client data such as client mortality predictions).

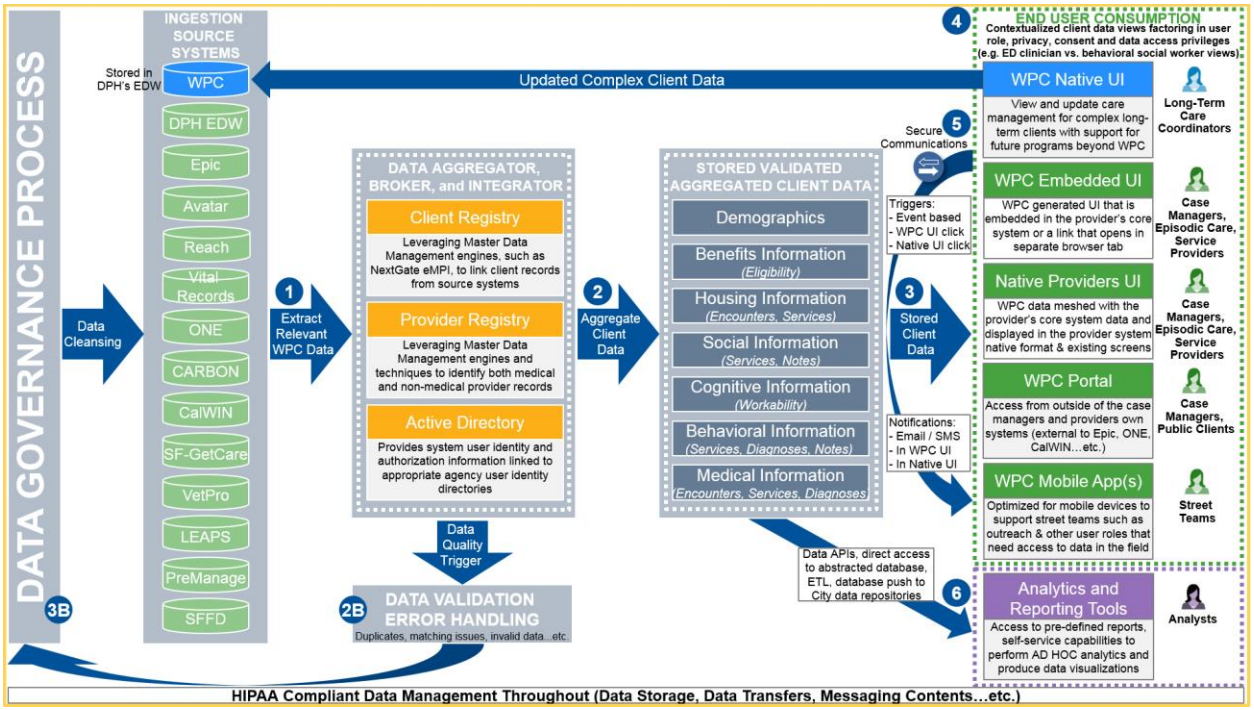
For more details see section 1.4 in Appendix 2 - Future State Solution Technical Requirements.

6.5 Data Flow Architecture View

The Data Flow Architecture View (Figure 6) provides a visual understanding of how data moves through the system from source systems of records to the various ways it is consumed or updated by end users. It shows the various integration options the platform is envisioned to support to enable access to WPC aggregated client data. Supporting multiple integration options provides the flexibility needed to allow system adoption by the various departments, each with their own system integration preferences and limitations.

This view also helps describe the key data related processes within the system and the system boundaries and dependencies on external systems.

Figure 6. Data Flow Architecture View



The diagram shows data flow starting with step 1 where data is ingested from source systems across City departments and aggregated together. The WPC data aggregator uses client and provider registries to resolve client identities and to correctly link the client records from the various source systems (step 2). Validated and aggregated client data is stored in a WPC aggregated data repository (step 3).

During the aggregation process, data validation based on predefined data cleansing rules are applied and errors captured and raised for data error handling before importing data into the WPC Platform (step 2B). Note that it is assumed that data errors must be addressed at the source system level by designated data stewards under guidance from a data governance board to promote data quality and resolve data quality issues arising from source systems (step 3B). This updated data will be re-extracted and processed by the WPC data aggregator.

Step 4 shows users that will consume the WPC aggregated data. The WPC Platform will provide a number of options for data consumptions, including:

- **WPC Native UI** — Available for a limited subset of users, this separate user interface with its own logon credentials must allow these users to both view and update complex long-term client data with care management capabilities that can support potential future client care programs beyond WPC. Data updates from this user interface must be stored in a separate WPC data repository that shall be treated as another source system of record.
- **WPC Embedded UI** — WPC generated UI that is embedded in one of the provider's core system screens or if not then a link in the provider's core system that opens it in a separate browser tab. This will require an update in the core system's that can support the embedding and have approved funding and resources to implement it.
- **Providers Native UI** — WPC data mixed with the provider's core system database data and displayed in the provider core system native format (colors, layout format…etc.)

within its existing screens. While this will result in a seamless user experience, it may require extensive updates to the core system.

- **WPC Portal** — View-only access to client aggregated data from outside of the case managers' and service providers' own systems (external to Epic, ONE, CalWIN…etc.). This shall be the UI used in situations where the authorized user's core system has not implemented UI integration with WPC.
- **WPC Mobile App(s)** — Native mobile application(s) or mobile-first responsive UI application(s) optimized for mobile devices to support street teams, e.g. Homeless Outreach Team (HOT), and other user roles that need access to WPC aggregated data in the field.

Users of the WPC Native UI that have appropriate authority will be able to update their designated complex long-term client's data. This data will be stored in a separate WPC data repository and will be treated as one of the source systems of record for WPC data aggregation.

WPC Platform users, regardless of access method will be able to exchange secure communication with each other as seen on the diagram in step 5. This will generate and route the appropriate messages and store inbound and outbound communications data for history tracking. For example, a Behavioral Health Case Manager using the WPC Embedded UI in Avatar will be able to view their client's care team members and have the option to send a message to either a specific member of a care team or all care team members.

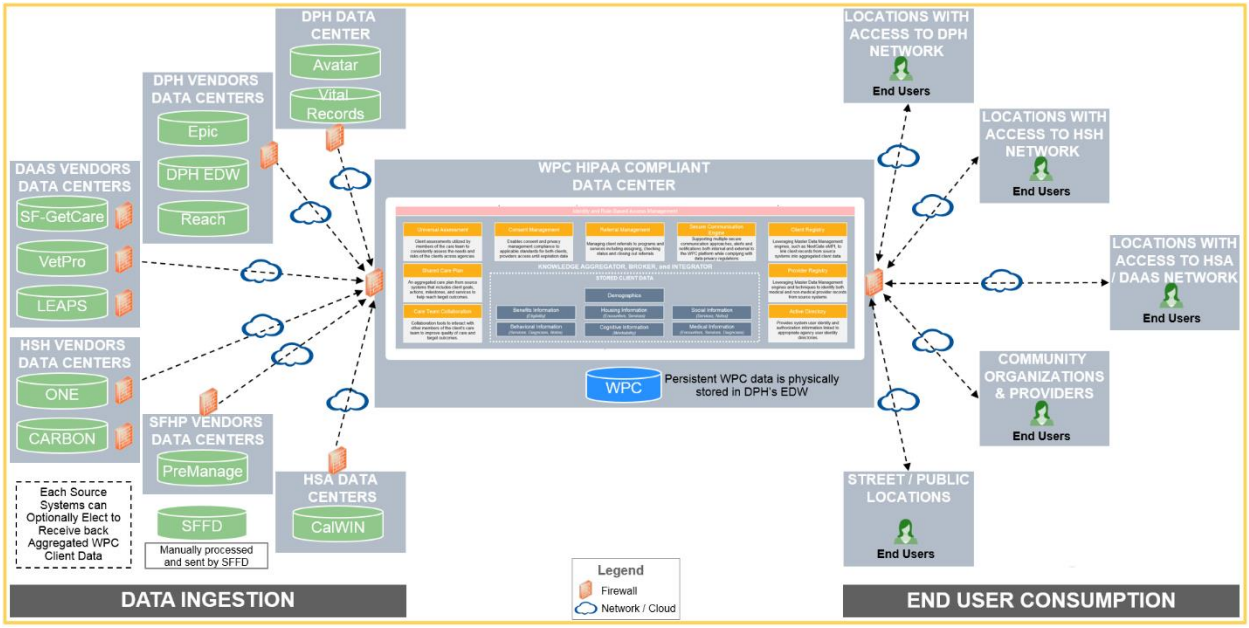
In step 6, WPC aggregated data will flow to populate pre-defined schedule reports or bulk reporting data repositories to allow analytics teams to create reports and conduct analysis.

For more details see section 1.5 in Appendix 2 - Future State Solution Technical Requirements.

6.6 Physical Location Architecture View

The Physical Location Architecture View (Figure 7) provides a visual understanding of the physical location of the various components of the system, which helps communicate the dependencies and impact on the overall system to determine the required network connectivity to each location.

Figure 7. Physical Location Architecture View



The diagram shows that the WPC technical ecosystem is made up of the following three main parties that are located at different physical locations:

- ***Source systems of records*** used for WPC data ingestion which are scattered across various City department data centers and in their vendors' data centers at different physical locations.
- ***WPC Platform*** envisioned to be hosted at the WPC Vendor data center location.
- ***WPC end users*** scattered across various locations including within City department firewalls and at community organization and service providers' premises. Additionally, some users, such as street outreach teams, will need access from public locations using an Internet connection.

The WPC Platform is envisioned to be used at these various physical locations by end users and will need to have access to the various source systems to ingest data. For example, a DPH Transitions Specialist located at Laguna Honda Hospital (LHH), which is part of DPH's network, would be able to access the WPC Platform and view their client's aggregated data including housing history ingested from HSH's ONE system so they can better plan for their client's discharge.

For more details see section 1.6 in Appendix 2 - Future State Solution Technical Requirements.

7.0 Implementation Vision and Guidelines

DPH envisions both a phased build and a phased implementation for the WPC Platform. This approach is intended to deliver incremental value as quickly as possible, to provide opportunities for DPH input during implementation, and to deliver meaningful value with each phase through leveraging dynamic technologies and implementation approaches.

In addition, the WPC Platform shall be designed with leverage and reuse in mind. DPH expects the WPC Platform to be built on common Commercial Off-The-Shelf (COTS) tools and infrastructure, components, and/or systems to shorten development and deployment time wherever possible, while preserving DPH's ability to meet the required unique business, functional, extensibility and scalability requirements – and at a reasonable total cost of ownership.

The components of the WPC Platform are expected to leverage contemporary IT industry best practices, such as leveraging light-weight Application Programmable Interfaces (APIs), rich client-side user interface technologies and containers. In addition, WPC expects the Vendor to bring a strong development methodology and development platform to allow for ongoing regression testing and deployment of solutions to the field. The WPC Platform integration layer shall allow multiple approaches for integration and interoperability including advanced approaches that are aligned with latest interoperability industry standards. The WPC Platform shall be based on up-to-date, mainstream technologies, and capable of flexible and effective integration with a wide range of other system and infrastructure platform components (whether from the same Vendor or not) that will be deployed by DPH.

Implementation Scope

The WPC Platform is expected to achieve the following:

- Functional scope outlined in the Business Capabilities and Requirements (see Appendix 1 Future State Solution Business Requirements)
- Aggregator functionality and Analytics infrastructure (see Appendix 2 Future State Solution Technical Requirements)
- Connecting a defined set of source systems and data consumption views to a defined set of destination systems (see section 1.5 of Appendix 2 Future State Solution Technical Requirement for list of source and data consumption systems)

The scope of this Project shall be organized into multiple, phased releases. The goal of each release is to incrementally deliver a highly focused set of functional capabilities and valuable business outcomes to the users aligned with the defined functional specifications. Features added in each phase will enhance the functionality developed and delivered in the previous phase(s) and replace existing functionality (so that current solutions can be retired) or introduce new functionality.

The Whole Person Care team will facilitate the prioritization of core capabilities that best meet the needs of clients, staff, and the organization. Design and development phases will be collaboratively defined by the WPC team and vendor partner(s). Each phase of the Project will incrementally address and incorporate needs of user groups, data sources, and features.

Capability requirements phasing is as follows:

#	Business Capability	Initial Implementation	Later Implementation Phase
1	**Client Case Management**	View all Client information as a Case	Advanced interaction with Client Case
2	**Shared Client Record and Client Information**	Consume and display consolidated data from all existing source systems with appropriate MOUs	Directly enter additional data
3	**Shared Needs Assessment**	Consume and display consolidated data from all existing source systems with appropriate MOUs	Directly enter additional data
4	**Shared Care Team**	Consume and display consolidated data from all existing source systems with appropriate MOUs	Directly enter additional data
5	**Shared Client Care Plan / Action Plan**	Consume and display consolidated data from all existing source systems with appropriate MOUs	Directly enter additional data
6	**City-wide Service Linkage Management and Tracking**	Consume and display consolidated data from all existing source systems with appropriate MOUs Display a directory of service linkage partners	Directly enter additional data
7	**Client Data Sharing & Other Authorizations**	Enabling of data sharing based on client authorizations	Storing and management of all relevant client authorizations
8	**Client Panel Management**	View key data for overall panel Receive alerts and notifications for data crossing set thresholds Display checklists and associated status for client panels	Decision-support intelligence prioritizing clients within the panel and impactful actions for individual clients
9	**Client Registry Management**	View key data for overall registries Receive alerts and notifications for data crossing set thresholds	Decision-support intelligence prioritizing clients within the registry and impactful actions for individual clients

#	Business Capability	Initial Implementation	Later Implementation Phase
		Display checklists and associated status for registries	
10	**Alerts and Communications**	Receive key alerts	Full alerts and communications functionality
11	**Workforce Management**	N/A	Full workforce management functionality
12	**Client Encounter Documentation**	N/A	Full encounter documentation functionality
13	**Shared Information outside of WPC Platform**	N/A	Share data to consuming systems
14	**Reporting and Analysis**	Access all data (via export or other means) for use outside of platform Utilization-related reporting for billing and reimbursement support	Customized Reports / Tools within platform

The Technical Capabilities that are required to enable each of the Business Capabilities will be implemented in coordination with the appropriate Phase.

The following sections describe DPH's vision and guidelines for implementation in more detail. Specific requirements are in Appendix 3 Future State Solution Implementation Requirements.

Implementation Approach

The WPC Platform implementation methodology must focus on two key areas: the delivery of incremental value and meeting the needs of a broad variety of end users. While DPH is looking to the Vendor to provide a proposed approach to achieve this, there are specific guidelines and principles that are important to DPH:

- Given the large variation in computer literacy and experience, DPH envisions the Vendor to focus significant efforts on ***Human Centric Design and Iterative Development involving users of the system from various organization and care disciplines***
- DPH envisions that the Vendor will use ***modern development process, tools and platforms*** to ensure rapid automated (regression) testing and tools for automated deployment of new releases into production
- It is envisioned that the selected partner / Vendor will ***leverage iterative / agile coding and project management methods*** to support incremental deployments and releases
- DPH envisions that a ***lab / sandbox type of environment will be available for testing ideas*** before releasing into production. This is especially important for program areas that are nascent and do not have fully matured business processes in place. DPH expects that in these areas, business processes and technology enablement may be

developed concurrently, requiring a dynamic development environment with a rapid release-to-production capability

- It is envisioned that the development environment and processes will support ***end-to-end integration testing*** to validate dependencies and ensure the WPC Platform supports end-to-end business processes
- DPH envisions that Vendor will ***integrate security into all aspects of solution implementation design, development and testing*** to ensure compliance with all applicable City, State and Federal security and privacy standards and guidelines. This will include providing evidence of Vendor's Project team passing privacy/security related training such as HIPPA compliance
- DPH envisions that the Vendor will ***use project management approach(s) that are in harmony with agile, iterative and human centric methods*** outlined above to reduce friction between project management and implementation activities

Transition to Maintenance and Operations

The Vendor will be fully responsible for hosting, maintenance and operation (M&O) of all solution components during the implementation phase. Upon completion of this initial implementation including testing (UAT, integration testing, etc.), DPH intends to have the option for the WPC Platform to be turned over to production and transitioned for M&O.

It is assumed that the Vendor will manage a robust process for testing the application thoroughly prior to release into production, WPC will provide resources to support User acceptance testing.

Once released into production, it is assumed that the Vendor will provide ongoing maintenance, monitoring and operational support for the entire solution and meet defined service levels.

8.0 Operational Vision and Guidelines

DPH is looking to the Vendor to host, maintain and operate the system to minimize the need for DPH staff and maximize the user experience. This requires a hosting and support model that is based on the following:

- The proposed WPC Platform(s) will be ***remote hosted***
- Ongoing system ***operations and monitoring will be provided by the Vendor***, including compliance monitoring with applicable security requirements
- Vendor will monitor and manage the application and agree to meet pre-defined Service Levels Agreements (SLAs) as defined in DPH's Vendor contract SOW
- DPH will provide a centralized helpdesk, ***conduct initial triage*** and route all level 2 and 3 tickets to the Vendor for resolution

The following sections describe DPH's vision and guidelines for ongoing operations in more detail. Specific requirements are in Appendix 4 Future State Solution Operational Requirements.

System Operations

- DPH envisions that the ***solution will operate 7x24x365*** with down-time allowed during agreed upon maintenance windows
- The ***Vendor will be responsible for ongoing system operations***, including administration / configuration of workflows, rules, tables, databases, etc.
- User administration is envisioned as a local / distributed ***function that can be performed by authorized DPH staff (but optionally contracted to the Vendor)***
- DPH envisions that the ***Vendor will monitor system and network performance end-to-end*** and ensure compliance and reporting on agreed upon SLAs, including Performance Management, Incident and Problem Management
- DPH envisions that the ***Vendor will devise comprehensive Capacity Management, Data Extraction, Retention and Archiving, and Disaster Recovery plans*** to enable business continuity. This is especially important for SaaS / remotely hosted solutions

Help Desk and Issue Resolution

- ***DPH will provide a central help desk for all WPC users*** to handle end-user calls and respond to incidents and user administrative issues, business related problems and questions around processes and policies
- DPH will establish a ***team of super users who will function as a Level 2 and 3 help desk*** for these type of issues
- The ***Vendor will provide Level 2 and 3 support for all application and infrastructure issues***, provide Issue Resolution, Problem Management Services and Root Cause Analysis
- The ***Vendor will establish processes and agreements with DPH for resolving network and facility related issues***

Enhancements and Solution Expansion

DPH expects that there will be an ongoing need for WPC Platform enhancements and expansions as new programs emerge and existing programs are continuity refined and improved. DPH envisions that these enhancements and expansions will come with respective

funding. While the scope of these enhancements and future initiatives is not known at this time, there are a few specific guidelines for this initial procurement:

- DPH envisions that there will be new systems from which users will need to be able to access the WPC systems and expects that there be a standard approach for integrating WPC with these systems based on a set of pre-defined and standardized mechanisms
- DPH envision that there will be a constant need to change data displayed on WPC screens present to users, reorder how this data is displayed and add new screen including but not limited to variations of existing screens and expects that there will a standard for creating and maintaining these screen as well as a rule based mechanism that determine which views / screen / data are displayed based on a combination of data, including the identity of the user, the context of the service / interaction, the system context from which the data is being accessed and key data contained in the client WPC data being accessed
- DPH envisions that ***there will be a need to connect additional source systems to the WPC Platform*** and expects that there be a standard approach for adding these data sources ***based on a set of pre-defined and standardized mechanisms*** to any new systems that meet the standards to send WPC data
- Similarly, ***there will be a need to provide WPC information to new destinations systems*** beyond the ones currently in scope for this initial implementation. DPH envisions that there be a standard protocol and pre-defined, standardized mechanisms for adding new destination systems
- DPH envisions that the ***Vendor will provide a transparent Change Control process*** to support modifications and enhancement requests by the City. This will include a methodology for sizing application requests and pricing them based on function point analysis or equivalent to help the City make and prioritize decisions