Annual Report: Health Information Exchange

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A Report Pursuant to Public Act 16-77, as amended by June Special Session Public Act 17-2, for the Connecticut General Assembly

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Table of Contents

Introduction and Background 2

Completed Activities of the Statewide Health Information Technology Plan & Data Standards ... 4

- Environmental Scan and Stakeholder Engagement 4
- Design Groups 5
- Electronic Clinical Quality Measure (eCQM) Design Group 5
- Immunization Information System (IIS) Design Group 6
- HIE Use Case Design Group 7

The Establishment of the Statewide HIE 9

- Approved Implementation Advance Planning Document (IAPD) Funding 9
- Submission of SIM OPS Plan 10
- Submission of Implementation Advanced Planning Document Update (IAPD-U) Appendix D 11

Recommendations for Policy, Regulatory, Legislative Changes, and Other Initiatives Promoting the State's Health Information Technology 11

Future Activities of Development and Implementation of the State-Wide Health Information Technology Plan and Data Standards 12

HIT Activities - Establishment of CDAS 12

HIT Activities - The Establishment of the Statewide HIE 13

- HIE Entity 16
- HIE Services 16
- HIT Shared Services Components 18
- HIE Interface with the CDAS 19
- HIE Use Case Services 20
- HIE Stakeholder Outreach and Workgroups 22
- HIE Support Services and Onboarding Activities 23

Recommendations for Policy, Regulatory and Legislative Changes and Other Initiatives to Promote the State's Health Information Technology and Exchange Goals 26

Appendix A: Health IT Advisory Council Membership 27

Appendix B: Biographies of HIT PMO 30

Introduction and Background

The State Innovation Model Project Management Office (SIM PMO) secured funds in May 2014 under Connecticut's SIM grant, and is using some of the funding to accelerate investments to promote a statewide HIE and clinical quality measure production[1]. The SIM Health Information Technology (HIT) advisory council met approximately fifteen (15) times over a course of eighteen (18) months to further define technology needs to support the SIM PMO's work with stakeholders to reform healthcare delivery, promote population health and value based insurance design, eliminate health inequities and to advance the use of alternative payment models. The SIM PMO solicited technical assistance from the Center for Medicare & Medicaid Innovation (CMMI)[2] and Office of the National Coordinator of Health Information Technology (ONC) to further define the State's technology needs.

On May 2, 2016, the Connecticut General Assembly passed Public Act 16-77 (P.A. 16-77), *An Act Concerning Patient Notices, Designation of a Health Information Technology Officer, Assets Purchased for the State-Wide Health Information Exchange and Membership of the State Health Information Technology Advisory Council.*" This act revises Public Act 15-146[3].

Public Act 16-77 required the Lieutenant Governor, the lead on the Connecticut's health reform initiatives, to designate a Health Information Technology Officer (HITO), responsible for coordinating all statewide health information technology initiatives and leading the effort for a statewide Health Information Exchange (HIE). The law transferred administrative authority of the statewide HIE to the HITO. The Act retains the HIT Advisory Council[4], a multi-stakeholder group that advises the State on statewide HIT issues. (See Appendix A: Member Roster.)

Public Act 16-77 required the HITO, in consultation with the statewide Health IT Advisory Council, to submit a report to the Connecticut General Assembly concerning:

(1) The development and implementation of the state-wide health information technology plan and data standards, established and implemented by the HITO;
(2) The establishment of the statewide HIE; and
(3) Recommendations for policy, regulatory and legislative changes and other initiatives to promote the state's Health Information Technology and Exchange goals

[1] Clinical quality measures (CQM) is a tool that helps measure and track the quality of healthcare services provided by healthcare providers. These measures use data associated with providers' ability to deliver high-quality care or relate to long-term goals for quality healthcare. Additional information can be found at https://www.healthit.gov/policy-researchers-implementers/clinical-quality-measures

[3] The 2015 Connecticut General Assembly passed Senate Bill No. 811 authorizing the Commissioner of the Department of Social Services (DSS) to administer a statewide Health Information Exchange (HIE). The resulting Public Act 15-146, An Act Concerning Hospitals, Insurers, and Health Care Consumers, also establishes a 28-member State Health Information Technology Advisory Council (Advisory Council). This was supplanted Public Act 16-77 in 2016.

[4] P.A. 16-77 statewide Health authorized the addition of three members to the statewide Health IT Advisory Council.

Connecticut's vision aligns with Connecticut Public Act 16-77 through the adoption and effective use of health IT to support quality improvement. To achieve the State's aims of healthier people, better healthcare, smarter spending, and health equity, the State will establish an interoperable HIE as envisioned by Public Act 16-77:

> *There shall be established a State-wide Health Information Exchange to empower consumers to make effective health care decisions, promote patient-centered care, improve the quality, safety, and value of health care, reduce waste and duplication of services, support clinical decision-making, keep confidential health information secure and make progress toward the state's public health goals. [Sec. 6, § 17-b-59d (a)]*[5]

The enactment of P.A. 16-77 also reorganized the scope of the State Innovation Model (SIM) HIT Council; it was integrated into statewide Health Information Technology (HIT) Advisory Council with the aim enhancing overall coordination of HIT efforts. The SIM grant provides funding supports for consulting services to the SIM PMO to facilitate and support the HIT Advisory Council, in conjunction with the support of the Office of the Lieutenant Governor.

In January 2017, the Lieutenant Governor designated Allan Hackney as the HITO. The HITO and the statewide HIT Advisory Council developed a strategic road map to include activities of (i) stakeholder engagement, (ii) environmental scan, (iii) use case development and prioritization, and (iv) the development of an HIE Plan.

June Special Session Public Act No. 17-2 amended Public Act 16-77 in two significant ways:

1. The Act created the Office of Health Strategy (OHS), combining the HITO and Health Information Technology Project Management Office (HIT PMO), the SIM PMO, the All Payer Claims Database and the Office of Healthcare Access into one entity—the office is effective on February 1, 2018--and
2. Authorizes the state to establish, or designate, a neutral, trusted organization representing public and private interests to operate agreed-to statewide HIE. This organization will establish and oversee a common set of policies, business practices, and standards to drive trusted health information exchange to support patient-centered care, ensure privacy and security of data exchanged, and to decrease the costs and complexity of exchange and analytics.

[5] https://www.cga.ct.gov/2016/ACT/pa/pdf/2016PA-00077-R00SB-00289-PA.pdf

Completed Activities of the Statewide Health Information Technology Plan & Data Standards

The HITO, HIT PMO, and SIM PMO completed activities in support of a statewide health information plan, HIE establishment, and policy, regulatory and legislative changes. In 2017, the HITO, the statewide HIT Advisory Council, and HIT PMO developed and completed the following activities:

- a broad and comprehensive environmental scan and stakeholder engagement,
- prioritization of a vast library of potential HIE use cases determine via multiple design groups,
- finalization of top ten prioritized use case cases
- a strategic road map

Environmental Scan and Stakeholder Engagement

In early 2017, the HITO produced a comprehensive environmental scan to assess the current HIT environment and to engage organizations to provide input on interests and priorities from statewide stakeholders. The HITO undertook this work over a three-month period with transparency, broad stakeholder input, and continuous communication. The results are informed by nearly 300 individuals representing over 130 organizations from across the healthcare system in Connecticut. The stakeholder engagement process consisted of seven distinct activities:

- Identify Stakeholder Domains
- Identify Stakeholders within Domains
- Define Topics to be Assessed
- Establish Mechanisms for Input
- Review Relevant Background Documents
- Gather Input
- Analyze Stakeholder Input

The resulting engagement process outlined nine priority recommendations, representing Connecticut's short-term and long-term goals for HIT and HIE:

1. Keep patients and consumers the primary focus
2. Leverage existing interoperability initiatives
3. Implement core technology that complements and interoperates with systems currently in use by private sector organizations
4. Establish "rules of the road" to provide an appropriate policy framework that:
    - engenders trust amongst all stakeholders
    - discourages inertia and duplicative solutions
    - creates patient and provider-centric, solutions-oriented cooperation
    - safeguards consumers' interests in privacy, security, confidentiality, and patient safety
    - encourages market-based solutions

- defines legislative and regulatory oversight

5. Support provider organizations and networks assuming accountability for quality and cost, with technical assistance, education, communications for data-sharing, and referral coordination
6. Ensure all stakeholders can securely exchange health information electronically with others involved in a patient's care
7. Implement workflow tools that will improve the efficiency and effectiveness of healthcare delivery. These include, but are not limited to:
    - ability to share data bi-directionally (report and query) with the Connecticut Department of Public Health (DPH) through the Connecticut Immunization Registry and Tracking System (CIRTS)
    - provision of a single, integrated clinical encounter alerts service for all patients
    - development and implementation of a robust statewide quality measurement system to collect electronic Clinical Quality Measures (eCQMs) and other quality measures
    - expanded use of direct messaging
8. Provide transparent oversight and coordination of State-owned and State-operated HIT assets
9. Establish, or designate, a neutral, trusted organization representing public and private interests to operate agreed-to statewide HIE services

Connecticut's strategy to provide increased health information exchange as outlined in the initial set of priorities established in 2017 will help to improve healthcare decisions and reduce unnecessary and redundant care. Improved HIE permits more rapid diagnosis of disease, follow-up on chronic disease and comorbidities, potentially prevents treatment complications such as medication errors, and provides immunization details and status via Immunization Information System (IIS) interface into the longitudinal health record.

The stakeholder engagement process, initiated by the HITO, and resulting environmental scan's purpose was to synthesize the "current state" and the "desired future state" for HIT and HIE services in Connecticut. The environmental scan also included an assessment of needs, current availability of technology, and an assessment of the readiness of providers and consumers to adopt and use services. As a direct result of these sessions, an eCQM Design Group, IIS Design Group, and a HIE Use Case Design Group were chartered to identify and recommend objectives, business functions, and alignment prioritization of HIE use cases.

Design Groups

Electronic Clinical Quality Measure (eCQM) Design Group

The eCQM Design Group was sponsored by the HITO, governed by the HIT Advisory Council, and supported by the SIM PMO, in consultation with the Office of the Lieutenant Governor. The following stakeholder groups were identified to be represented by Design Group members:

- Healthcare Consumers
- Commercial Payers
- Community Hospitals

- Clinicians
- Federally Qualified Health Centers (FQHCs)
- Behavioral Health Providers
- Hospital System
- Office of the State Comptroller
- State Human Services Agencies

The Design Group also outlined governance, operations, and general recommendations for a statewide quality measurement system for presentation and further deliberation by the HIT Advisory Council at its April 20, 2017 meeting.

Immunization Information System (IIS) Design Group

The IIS Design Group was organized by the HITO and sponsored by the HIT Advisory Council, and supported by Department of Public Health (DPH), in consultation with the Office of the Lieutenant Governor and the Commissioner of DPH. The following stakeholder groups were identified to be represented by Design Group members:

- Family Physician with Informatics Expertise
- Pediatrician from Federally Qualified Health Centers (FQHCs)
- Pediatrician from Hospital
- Head of a large Nursing School Program
- Other subject matter experts as needed

The IIS Design Group deliberated and identified recommendations to help support the planning and implementation of the new IIS platform and the essential collaboration that will be required to ensure alignment with HIE services. Recommendations are as follows:

- **Implement Priority Use Cases -** The IIS should support a lifetime immunization record (birth through adult) that is interoperable with a focus on two priority use cases:
    - The ability for providers to send information about immunization history directory from their EHR to the IIS
    - The ability for providers, consumers, and other authorized users to be able to query and retrieve immunization history from the IIS to support real-time access at the point of care
- **Leverage and Align Efforts with HIE services -** HIE shared services should be leveraged to support the IIS priority use cases
- **Maximize collaboration and planning across federal programs -** Collaboration should be strengthened between Connecticut agencies including DPH, Department of Social Services (DSS), the HITO, and others, and with federal partners including Centers for Disease Control (CDC), the ONC, and Center for Medicare Services (CMS)

- **Provide ongoing stakeholder engagement -** Feedback should be gathered from stakeholders during agile development sprints
- **Propose necessary legislative updates -** Legislation should be advanced to establish a lifetime registry (birth through adult)
- **Need for technical assistance, training and education to support provider organizations -** Adequate resources should be allocated for education, training and comprehensive technical assistance and these should be offered to provider organizations to support multiple ways for providers to enter data, upload, and check immunizations via portal and web services, including EHR connectivity and use of the new IIS

The IIS Design Group noted the importance of aligning and leveraging both technical and financial resources to achieve the financial sustainability required to deliver the basic technology infrastructure needed in the state. In September 2017, the HIT Advisory Council accepted the IIS Design Group recommendations for IIS.

HIE Use Case Design Group

The HIE Use Case Design Group consisted of payers, providers, health systems, consumers, and others. The Design Group developed and reviewed a library of potential HIE use cases that represented all stakeholders in Connecticut's healthcare system. The design group developed criteria to evaluate which use cases should be advanced to subsequent phases of prioritization (Stage 1: Original; Stage 2: Expanded; Stage 3: Final), and approved a template for the content for each use case. The prioritization was driven by the Design Group's analysis of the value expected to be created for various stakeholders when HIE services to support the use case are broadly available in Connecticut. The eCQM and IIS use cases previously identified by the HIT Advisory Council as priorities were reconfirmed by the Design Group as key priorities.

Connecticut continued to prioritize investments through a rigorous deliberation process by the HIT Advisory Council and the HIE Use Case Design Group. The HIE Use Case Design Group reviewed 31 use cases, ten were approved. These ten will be divided into two "waves" and are targeted for implementation in the first two years of HIE services.

In addition to the prioritization of the use cases, value propositions and high-level functional requirements were determined for each of the ten use cases. Criteria for prioritizing the HIE Use Cases included, value for patients, consumers, and stakeholders; workflow impact; ease of implementation; technical assistance needs; prerequisites of technology components, scalability; and existing infrastructure and resources. While some use cases were valued as high priority, technical prerequisite criteria, as well as others, prescribed which wave the use case could be accomplished. These ten will be divided into two "waves." Six use cases were selected to be part of Wave 1, targeted for implementation in the first year of HIE services.

The following six use cases were prioritized as Wave 1 HIE Use Cases

1. **eCQMs:** Support transport of clinical data for use by the Core Data and Analytics Solution (CDAS) for quality measures and provide person-centric measures, trusted

data, and decreased administrative burden to providers, as well as value to insurers and providers supporting value based performance.

2. **Longitudinal Health Record (Clinical Health Data):** Real-time access to patient clinical health data across EHRs will reduce duplication of procedures and services, improve patient safety and plans of care, and support increased work efficacy and efficiency.
3. **Clinical Encounter Alerts:** Improve care management by driving access to and adoption of clinical encounter alerts. Clinical encounter alerts can add value to patients, providers, and insurers by improving care coordination, avoid unnecessary readmissions, ensure follow-up to care, and enable meaningful use compliance.
4. **IIS:** Reduce duplicative vaccine administration and improve reporting efficiency by creating the capability for healthcare providers, including school nurses, to electronically send vaccine information, vaccination, and immunization information to the State by improving the ease of accessing this information at the point of care. The IIS can allow providers, healthcare organizations, schools, licensed childcare programs, pharmacies, consumers, and other stakeholders to access up-to-date patient immunization history.
5. **Public Health Reporting:** Improve efficiency by establishing a single gateway for public health reporting for healthcare providers and receive timely and accurate information to protect safety, track, and predict events. An additional value is cost savings of real-time, automatic, electronic transmission of information to public health agencies that will accrue to healthcare providers, payers, patients, and public health agencies.
6. **Image Exchange:** Reduce duplicative X-rays, ultrasounds, and other imaging by increasing the electronic sharing and viewing of imaging between providers and provide improved communication and care-coordination of patients.

The HIE Use Case Design Group further developed and reviewed the library of potential HIE use cases and prioritized the Wave 2 of use cases utilizing the same use case prioritization template. The Wave 2 of use cases are shown below. Objectives in Wave 1 need to be informed by the requirements in Wave 2 use cases. Consequently, the Wave 1 uses cases will be designed and implemented to support and anticipate technical and architectural needs of Wave 2 use cases.

The actual prioritization of Wave 2 use cases will be determined as part of long-term planning for HIE services in Connecticut. HIT PMO will seek the advice of the HIT Advisory Council to determine prioritization of Wave 2 use cases based on upon progress made and technical prerequisites

1. **Medication Reconciliation:** Reduce medication morbidity, mortality, and adverse reactions by enabling the information exchange necessary for medication reconciliation and supporting process re-design for prescribers and pharmacies. Additional value of medication reconciliation for patients and providers is when real-time updates are provided on medications filled, started, stopped, discontinued, and modified and include prescription, non-prescription medications, and allergies to ensure comprehensive medication lists.

2. **Advanced Directives and Medical Orders for Life Sustaining Treatment (MOLST):** Enable person-centered and empowered care through the capture and accessibility of patient care preferences for treatment and end-of-life support. Patients and their families will receive the care they desire in a dignified manner, allow for care coordination across healthcare settings, and realized savings from avoided end-of-life treatment contrary to patient's preference.
3. **Population Health Analytics:** HIE services can enable the transport of additional information from EHRs into CDAS, provide timely insight into health outcomes, and create an environment of informed decision making at local, community and state levels.
4. **Patient Portal:** Enable consumer empowerment through patient access to their statewide longitudinal virtual health record which is critical to their quality of care, care coordination, and patient satisfaction and will provide a single aggregation point of their historical healthcare data

The HIE Use Case Design Group began on June 27, 2017 and continued through October 11, 2017, with a presentation of the final recommendations to the Health IT Advisory Council on October 19, 2017. At the October 2017 HIT Advisory Council Meeting, the Advisory Council members approved the recommendation from the Design Group to accept the framework as an initial approach for services in Connecticut and initial deployment for planning and design going forward.

The Establishment of the Statewide HIE

Under the HITO, the HIT PMO in coordination with the SIM PMO have accomplished planning, developing and implementing activities that support the establishment of a statewide HIE. Over the last year, these activities have included the submission and approval of the Appendix D Implementation Advance Planning Document (IAPD) funding request for planning, submission of State Innovation Model Operational Plan Award Year 3 Update, and the submission of Appendix D IAPD-Update for additional funding for implementation of the HIE.

Approved Implementation Advance Planning Document (IAPD) Funding

In June of 2017 HIT PMO submitted the IAPD, which was approved on October 4th. The approved funding of $4.9M in the IAPD is for planning activities as well as funding to perform detailed functional requirements that will inform technical requirements, and also covers four service areas. The funding for expert consultants is to support four service areas:

- **HIT Planning -** (Meeting facilitation, strategic planning support, proposal / document writing)
- **eCQM -** (Refine business drivers/requirements to define functional and technical specifications, deployment strategy)
- **HIE –** (Refine business drivers/requirements to define functional and technical specifications, develop an RFP for HIE Services, solicitations and vendor management, and **electronic strategy** for Technical Standards)
- **Sustainability Model – (**design practical financial models for CT to fund ongoing operations of the HIE)

Submission of SIM OPS Plan

On December 1st, 2017 the SIM PMO submitted the SIM Operational Plan Award Year 3 Update to CMMI. The SIM OPS plan requested funding for $8.5M for CDAS to support Connecticut's efforts for eCQMs and clinical quality and utilization measures. As alternative payment models and changes in care delivery proposed under SIM expand, accountable healthcare providers will need the data, information, and tools to succeed.

Connecticut contains a high penetration of accountable healthcare organizations who are making investments in data exchange and analytics. The gaps identified through the environmental scan and highlighted in the SIM Ops plan are as follows:

- Providers struggle to electronically exchange health information between disparate health system
- Lack of widespread access to important medical information, including medical histories, diagnostic images, and emergency department notifications, negatively impacts diagnosis and treatment decisions, and increases the use of costly and potentially harmful duplicative tests.
- Healthcare providers have incomplete information about how well they deliver care, relying on claims-based, insurer-specific patient data, or clinical data from their lone EHRs.
- Incomplete and silo'd data makes it difficult to manage gaps in care, target interventions, and compare their performance to peers and to aggregated populations
- Payers enter into value-based contracts with providers using this same limiting data. Varying reporting requirements and processes across these value-based payment arrangements and other quality improvement programs add complexity and burden for providers.

To achieve the State's SIM aims of healthier people, better healthcare, smarter spending, and health equity, the State will establish CDAS services, and interoperable (HIE) services as envisioned by Public Act 16-77 as amended and identified in the SIM OPS Plan and IAPD-U.

Submission of Implementation Advanced Planning Document Update (IAPD-U) Appendix D

On December 21, 2017, The State of Connecticut HIT PMO in collaboration with the Department of Public Health presented on activities and budget of the Implementation Advanced Planning Document Update (IAPD-U) Appendix D (HIE Activities) to the HIT Advisory Council. The IAPD-U was submitted to the Department of Social Services on December 29, 2017 for final submission to Center for Medicaid Services (CMS) for funding to support four streams of implementation activities for the Health Information Exchange (HIE). This IAPD-U funding request is broken into 4 near-term activities and requests a total of $11.6 mil for the period of this IAPD-U (8 quarters over 2018-2019). This funding request is for two years and the intention is to ask for what is minimally reasonable to stand up prioritized use cases. The funding requested will implement wave 1, while designing wave 2. The work will be implemented in 2 years and will prove the value of our use cases to stakeholders. As a consequence of the incremental delivery approach of the HIE, each use case will be implemented, tested, and deployed based on preexisting use case technologies and value proposition to stakeholders. A use case in its entirety may be implemented across multiple releases and may continue beyond the scope of 2019 and the IAPD-U. For example, depending on the use case, foundational technical requirements and components can drive deployment of functionality. Soliciting stakeholder feedback creates buy-in to use the system and creates a system that meets users' needs by leveraging an information loop of stakeholder user testing and feedback for development through multiple versions prior to deployment. Consistent with the incremental approach, Connecticut is likely to seek additional funds beyond 2020. These activities are part of the HIT Annual plan and are outlined below in "Future Activities."

Recommendations for Policy, Regulatory, Legislative Changes, and Other Initiatives Promoting the State's Health Information Technology

As mentioned above, during October of 2017, the State of Connecticut, enabled by recent legislation June Special Session Public Act No. 17-2 aims to establish, or designate, a neutral, trusted organization representing public and private interests to operate agreed-to statewide HIE. This organization will establish and oversee a common set of policies, business practices, and standards to drive trusted health information exchange to support patient-centered care, ensure privacy and security of data exchanged, and to decrease the costs and complexity of exchange and analytics.

In November 2017the HIT Advisory Council approved the formation of a Governance Design Group. Funding already approved in the IAPD for planning will support the execution of a Governance Design Group. The design group will recommend a trust framework model for the State based on an analysis of existing trust agreements used by national and state exchanges.

Future Activities of Development and Implementation of the State-Wide Health Information Technology Plan and Data Standards

The HITO and HIT PMO in coordination with the SIM PMO have identified future activities to be developed and implemented within the next two years as identified in the SIM OPS Plan and Appendix D of the IAPD-U and are highlighted below.

HIT Activities - Establishment of CDAS

While the State will establish a state-of-the-art, holistic, information management system, the strategy to enable health information exchange and better use of data requires more than a technical solution. The strategy, enabled with the technology, will align with the movement towards alternative payment models, as promoted by SIM. These new payment models give providers incentives to improve the efficiency, effectiveness and outcomes of patient healthcare, and therefore more of a reason to share information. Technical and analytics assistance to providers on how to best use HIT tools, data and information will support transformation and influence behavior change. Trust and governance will accelerate progress in a transparent way.

Under the OHS, the SIM and HIT teams will collaborate to establish CDAS to further promote SIM's initiatives. In the short-term, the CDAS will promote use of eCQMs and advanced analytics by improving outcomes by increasing the use of eCQMs and analytics in quality improvement and alternative payment model efforts of payers, providers, and employers. In the long-term, the solution is to expand CDAS outputs, including population health analytics by enabling more targeted, holistic, and population health centered interventions through the use of additional data sources, such as social determinant of health data, public data sources, and other sources Expanded analysis of individual health information at the population level will support machine-learning, automated analysis, geolocation, predictive analytics, evaluating health interventions, comparing healthcare services, identifying patient safety events, supporting policy and workforce planning, and solving complex social and health issues.

During the initial CDAS eCQMs and analytics work with the Office of the State Comptroller (OSC), an interim data use agreement will be developed and executed to support the first phase of measure calculations using flat file extracts. The CDAS will enhance statewide data sharing and enable the analytic capabilities to provide data and information to drive efficient, effective, and personalized patient-centered care to improve health outcomes. The CDAS is primarily focused on quality and utilization measures and analytics to enable value-based care initiatives.

Connecticut's healthcare system has varied and often suboptimal performance on preventive care, diabetes outcomes, prenatal and postpartum care, and mental health outcomes. Clinical quality measures where EHRs are the primary data source, such as eCQMs, have come to the forefront as a means to shed light on healthcare performance, but they are not widely used in Connecticut. The State will work with public and private payers, employers, accountable healthcare organizations, and others to align strategies and increase the reporting and use of eCQMs for measuring outcomes and informing quality improvement activities. These actors have

limited insight into the above priorities because this robust and actionable data from multiple sources is not available to them.

During the initial stages of CDAS implementation, provider outreach and engagement will be broad and inclusive, including outreach to Accountable Care Organizations (ACOs) and FQHCs to increase and expedite the submission of clinical data. The CDAS will provide self-service quality and utilization measures analysis with focused visualizations, dashboards, data extracts and ad-hoc analysis capabilities to these providers. Providers will be able to track and trend the quality of care delivered, avoid preventable events, and address gaps-in-care to improve outcomes and maximize incentives. See subsequent sections for more information.

An initial set of accountable healthcare organizations will be solicited by the OHS to work with the HIT PMO and the Office of the State Comptroller (OSC - the State agency responsible for contracting for and managing health benefits for the state employee and retiree populations). The OSC will receive eCQM data to better monitor providers and give them feedback and tools so that they can improve care delivery to the state public employee population.

Additional provider groups, as well as commercial payers will also be engaged following successful pilot implementations with OSC. The HIT PMO will collaborate with DSS to determine how CDAS capabilities can be leveraged to support the Medicaid program. CDAS will allow payers the self-service capability to view visualizations, dashboards and conduct ad-hoc analysis by providers and/or various programs.

The CDAS architecture is designed as a purely modular framework to provide dynamic configurations and scalability to meet the needs of the stakeholders, current and future. The architecture is based on leading technologies that have been implemented across many other industries and leverages open source and commercial off the shelf (COTS) components. This architecture approach along with the technology components provides a configurable solution and not a custom coded solution.

The CDAS, like the HIE, will be implemented in multiple Stages to deliver functionality to the stakeholders/users in a timely and efficient manner, following an Agile SDLC. Each Stage will focus on the delivery and release of solution components as they become available. The agile process will focus on the required functionality captured in the use cases and will require the stakeholders' continuous input to validate development efforts to requirements. Functionality enhancements can be made at development time instead of waiting for the system to be fully implemented.

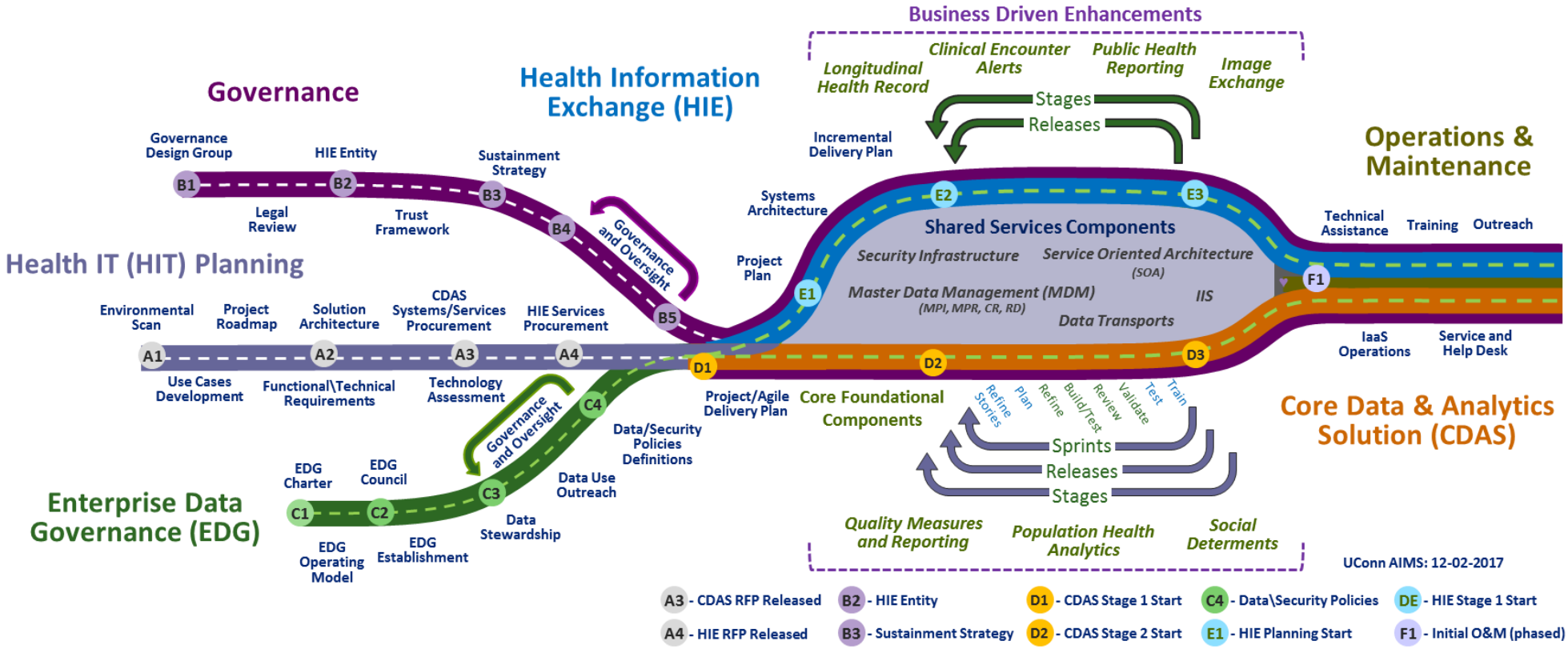
HIT Activities - The Establishment of the Statewide HIE

The establishment and infrastructure of the State's HIE services is comprised of HIE entity, HIE services, shared services, CDAS, outreach, and onboarding. The funding requested through the IAPD-U included the procurement of an existing HIE service the establishment of the foundational infrastructure, technical assistance to interface with HIE, shared service components and CDAS, and services to implement functional requirements as captured within the use cases.

The HIE and CDAS solution architecture is a business driven and technology enabled solution that is designed to address some of the gaps and opportunities, such as consumers experiencing a fragmented health system where the information needed by their care team, or the consumers themselves is not always easily accessible. As such healthcare providers have incomplete information and feedback about how well they deliver care. The lack of widespread access to important health information, including medical histories, alerts, and notifications negatively impacts diagnosis and treatment decisions.

The architecture is designed as a holistic information management solution, where common system components were identified as core shared services. Each of the shared service requirements were compiled and mapped across all use cases. During the development of the roadmap and based on the agile procurement and incremental implementation of the solution components, the shared service components were detailed to be incrementally implemented as required to meet the delivery of use cases. The HIT strategic roadmap, shown below in Figure 1 has four major lanes (i) Governance, (ii) Enterprise Data Governance, (iii) HIE, and (iv) CDAS, discussed in the following sections.

Figure 1: HIT Strategic Roadmap



HIE Entity

Trust is widely viewed as foundational to any initiative in interoperability and health information exchange. Connecticut stakeholders, through the stakeholder engagement process in early 2017, expressed frustration at the State's previous failed efforts to implement HIE services and a lack of coordination across state agencies with respect to HIT assets. Stakeholders also cited a lack of clear and timely information about HIE initiatives. The establishment of the HIE entity will serve as the State Designated Entity (SDE) along with its Board of Directors and the HIT Advisory Council will help form a cohesive and unified message for health information exchange.

At its November 16, 2017 meeting, the HIT Advisory Council approved a Design Group to develop recommendations regarding the HIE governance model and will convene in mid-February. The design group will recommend a trust framework model, including the related trust agreements, data use agreements, policies and procedures, and a consent model for the state based on an analysis of existing trust agreements by the HIT PMO used by national and state exchanges. Additionally, this work will address both organizational structures and how to best establish a trust framework for the state. The trust framework model that the design group recommends will be reviewed by the Office of the Attorney General. The Design Group will include council and non-council members and will meet to develop recommendations for the Council's consideration.

The HIE entity may establish a Data Governance Council (DGC) for both HIE and CDAS services. Data governance activities will identify, research, create, establish, and audit State-approved HIE- and CDAS-related policies, procedures, guidelines, and standards relating to data collection, use, privacy, compliance, di-identification/masking, encryption, and security. The HIE Entity will set overall data governance policy and the DGC will develop and implement the details of how that data governance policy will be enacted and operated.

In addition, because of Connecticut's commitment to the development and implementation of a sound financial plan that will ensure the long-term sustainability of the services, the HIE entity's Board will concentrate on the financial sustainability of the HIE as soon as it is established

HIE Services

The HIE services will be a network-of-networks configuration, allowing both individual EHRs and already existing HIE initiatives to connect and share data. This configuration supports the federated HIE data model, as the EHRs' patients' data will remain within the individual systems of record and be pulled or pushed from HIE services as required. The HIE Services used to support the identified use cases will ensure healthcare organizations in Connecticut have the ability to exchange data in a secure, standard, and flexible environment, whether they are connecting through a community, state agency or private HIE service provider, using national standards for point-to-point exchange, or participating in a national network.

A principal objective of the procurement process for HIE services will be identifying services that can deliver on requirements for HIE use cases with minimal customization. Any enhancements to use case that are needed for the delivery of functionality that is not already "out of the box"

will be customized. However, it is important to note that customization for CT will be minimal. We are going to adopt a standard approach whenever possible, our intention is to not impose unique componentry to Connecticut. Our approach is to use “as is” existing services. We want functionality that can easily morph and join with other national and regional standards and to avoid trying to develop new capabilities unique to CT that would introduce new requirements that won’t align with standards outside of CT and preclude us from a regional solution.

Based on the accepted recommendations arising from the stakeholder outreach and the three design groups, the HIT Advisory Council expressed a preference to use an existing service model, rather than develop new technology to deliver on the HIE needs. The state examined other HIE implementations with respect to their ability to scale and deliver the required services as identified in the use cases and leverage lessons. As a consequence of this preliminary work, the HIT PMO is confident that an existing multi-state HIE partner offering will be found to meet Connecticut’s requirements.

The proposed solution architecture and roadmap highlights an incremental implementation approach and alignment of internal and external dependencies, with a goal to establish a trusted and secure data sharing and information foundation across the delivery system. The architecture and roadmap are guided by the stakeholders’ needs for data and information.

The HIE will be implemented in multiple stages to deliver functionality to the stakeholders/users in a timely and efficient manner, following an incremental delivery methodology and procurement process. Following the procurement of HIE services, a standard delivery process will be followed initially implementing core infrastructure including hardware, security components and access controls, data interface connections, and hosting services. The initial costs of implementation of HIE core infrastructure services will be higher in the first year and decrease in the second year as primary infrastructure is in place and operational. Following the implementation of core infrastructure, the design, implementation, testing and training of HIE core services will be delivered. These core services will focus on the installation and configuration of HIE componentry; including enhancement, transformation and alignment of data, management and auditing, technical assistance and deploying to existing EHRs via standard protocols. Each stage will focus on the release of solution components as required to deliver the functionality captured in the use cases. This will require the stakeholders’ input to validate development efforts to requirements, where functional enhancements can be made at development time instead of waiting for the system to be fully implemented.

Optimizing access to Medicaid patient data and recognizing a statutory obligation for hospitals to be connected within one year of operations, the initial implementation of use cases will focus on one or two Federally Qualified Health Centers (FQHCs) and a large hospital. The HIE will utilize existing interfaces to obtain data from the FQHCs and a hospital in the format of Continuity of Care Documents (CCDs) and/or Quality Reporting Document Architecture (QRDA) Category I (QRDA-I) to the HIE.

Prior to implementing and connecting with additional FQHCs, hospitals, and providers, the HIE will test and prove that the architecture is working. The initial implementation will focus efforts on

building to match patients and providers and establish care relationships. The result is proven capability to patient matching that will ensure the success of future connections and value proposition to stakeholders. Once stable service is verified, our intention is to deploy to the remaining FQHCs, hospitals, and small independent provider groups to include additional EHRs, CDAs, and lab information. As a component of the deployment strategy, the HIT PMO will develop and recommend a sequence of connections as the HIE scales based on readiness at care settings and priorities that will be reviewed with the HIT Advisory Council for evaluation. Included in these connections will be long-term care post-acute facilities, behavioral health, skilled nursing, laboratories, home care providers and other similar healthcare organizations.

HIT Shared Services Components

One of the foundational services to provide a single, combined view of data regardless of the data origination point is to follow information management best practices of Master Data Management (MDM). This will capture a unified view of person, provider, and relationship data in a manner to deliver a best instance of identity, as a service. For example, the architectural approach that we wish to achieve would allow the interface of these identity services with other master person index and provider registry systems, such as, Medicaid Enterprise Master Patient Index (EMPI), Medicaid Provider Directory (PD), and other related tools.

Stakeholder outreach and feedback, and the movement to interface shared services via published web services and application programming interface (API) architectures, signifies a clear objective to provide an identity as a service for use by other stakeholders. A key component of the architecture is access controls to ensure appropriate and permitted use of data through identity management.

The architectural approach allows the interface of these identity services with other master person index and provider registry systems, such as EMPI and PD. HIT PMO will develop a detailed list of MDM requirements to deliver the specific use cases functionality by collaborating with health ecosystem. Based on the detailed list of requirements, an assessment of existing state assets will determine the fit level capability relative to the requirements. This analysis will determine the best solution(s) for Connecticut's HIT PMO to achieve use case implementation.

An additional shared service will perform the transformation of data to align and normalize the data for interoperability across EHR systems. These services will provide data parsing and standardization to classify, de-duplicate and enrich clinical data and enable improved patient care and clinical informatics. Quality control and assurance capability will be used for alerts and scorecards to enable providers to better understand and improve the quality of data in their EHRs.

As part of the funding for enhancing the shared services components, HIT PMO will evaluate existing assets in the state against requirements by developing a detailed list of MDM requirements to deliver the specific use cases functionality. Based on the detailed list of requirements, an assessment of existing assets in the state will determine the fit level capability relative to the requirements. This analysis will determine the best solution(s) for Connecticut's HIT PMO to achieve use case implementation

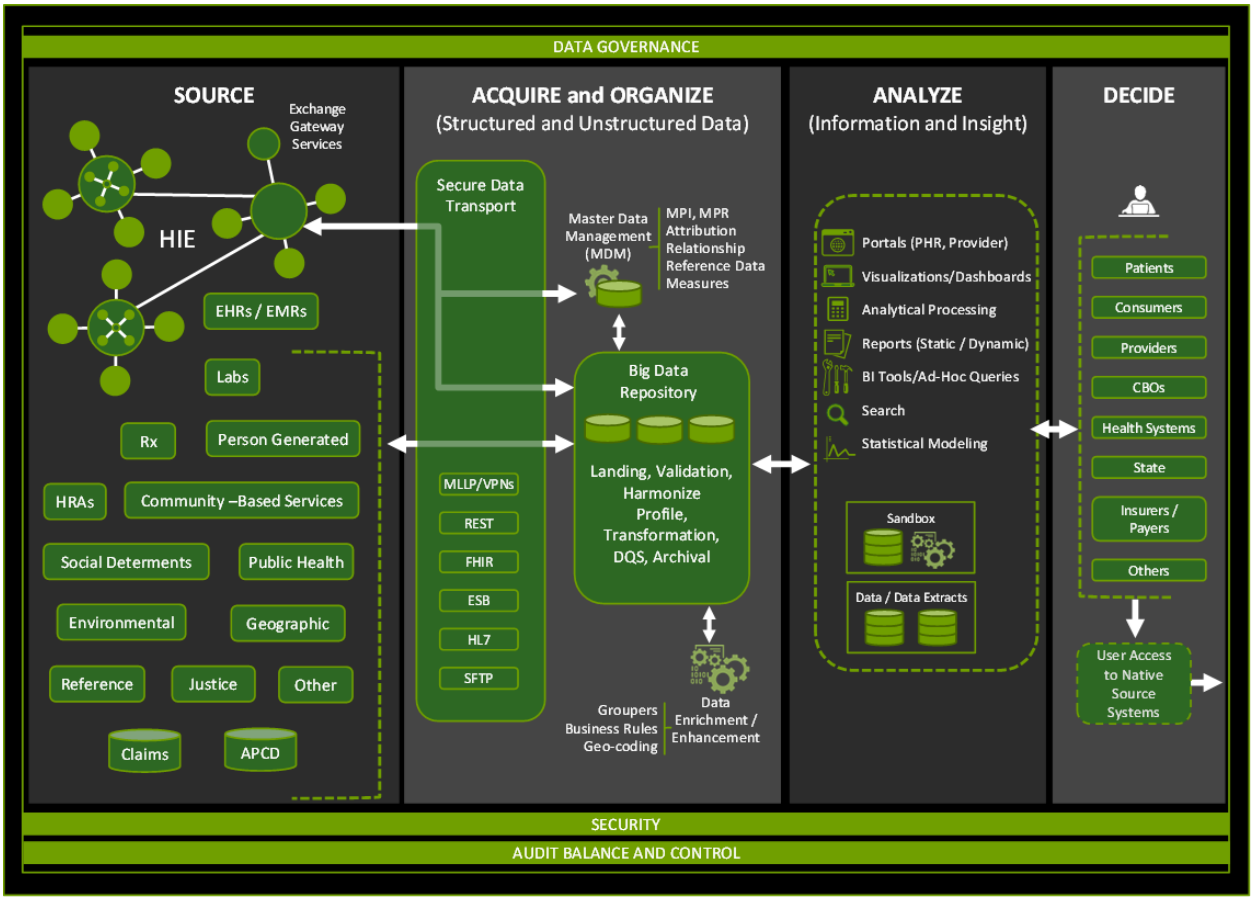
HIE Interface with the CDAS

The CDAS will enhance statewide data sharing and enable the analytic capabilities to provide data and information to drive efficient, effective, and personalized patient-centered care to improve health outcomes. The CDAS is primarily focused on quality and utilization measures and analytics to enable value-based care initiatives. The first stage of work is related to the priority use case for eCQMs, population health, and reporting. The State will utilize the HIE and the shared identity management services and secure transport protocols to accept CCD and QRDA-I transactions from EHRs and deliver them to the CDAS, with appropriate quality assurance, for the calculation of eCQMs and other quality measures.

Additionally, insights and discrepancies that are derived by the analytics associated with the eCQMs may generate transactions in the form of data inconsistencies or alerts and be routed back to providers. Consequently, providers will realize value in these transactions and their increased ability to improve their data, while decreasing the burden of file maintenance on the providers. An example of improved data as a result of these transactions can be demonstrated by the use of claims and EHR data. Payers, including Medicaid, want patients to have a continuum of care with the same primary provider. The CDAS analytic capabilities will be able to identify patients that are provider hopping through monitoring continuous change in a person's provider attribution when data reflects multiple discrepancies in client Primary Care Physician (PCP) attribution.

This solution will initially focus on two core solution components: HIE services and the CDAS, as shown in **Figure 2**, which are both guided by the governance. The HIE services focus on increasing secure and authorized information exchange between disparate healthcare systems. CDAS will enable advanced analytics and quality and utilization measures production. The HIE will interface with the CDAS so patient health data, such as clinical labs, tests, and vitals, can be leveraged for the calculation of clinical quality measures.

Figure 2



HIE Use Case Services

As mentioned above the HIT Advisory Council approved ten use cases that are divided into two "waves" and are targeted for implementation in the first two years of HIE services. HIT PMO will develop a detailed list of requirements to deliver the specific use cases functionality by collaborating with the health ecosystem.

eCQMs

This eCQMs use case focus provides providers the ability to push their patients' clinical data, in CCD and QRDA-I formats, from the EHR(s) via the HIE to the CDAS, where their measures can be calculated, validated, and submitted for meaningful use. The CDAS architecture is based on leading open source and COTS software components and will provide the capability of an eCQM point solution. However, our goal is to have a single solution that can do much more than just calculate eCQMs. The CDAS innovative design will provide the functionality to calculate numerous quality and utilization measures based on the dynamic configuration of measure's business logic and reference data within the MDM.

Longitudinal Health Record (Clinical Health Data)

Timely and efficient access to patients' clinical health data across EHRs by healthcare professionals may inform diagnosis and treatment decisions, reduce duplication of tests, and save patients and providers' time and money by reducing the burden associated with collecting information. This use case provides providers the ability to query across the HIE to other EHRs to capture a snapshot of a patients most recent and relevant information. The HIE will provide technical assistance for onboarding providers, health systems, and other caregivers and support the deployment services through the HIE.

The entity will implement a provider portal to support the caregivers that do not have certified, interoperable EHRs, to enable those caregivers with a view of their patients' clinical health data in addition to a historical longitudinal view captured in a person's virtual health record (VHR) as a component of the CDAS.

Clinical Encounter Alerts

The State understands that clinical encounter alerts can improve care quality, continuity of care, and care transitions by, in near-real time, notifying responsible caregivers, such as primary care physicians, PCMHs, ACOs, payers, research organizations and hospital readmission programs, when patients have a clinical event such as an admission or discharge to or from an inpatient facility, emergency department, or outpatient care facility. Most providers do not know when a clinical event for one of their patients occurs outside of their practice. Providers can identify the patients for whom they would like to receive clinical encounter alerts allowing them to proactively follow up with the patient and care coordination can be initiated. Technical assistance may include supporting practices in thinking through how to stratify their patient populations and in deciding what kind of encounters they want to receive. Currently, clinical encounter alert systems in Connecticut are not fully utilized by the above-mentioned organizations for all patients requiring care coordination or transition of care support.

Connecticut plans to engage in further assessment of current systems in the state in order to delineate the functional and business requirements of clinical encounter alert technology. The assessment may include assessing the need for clinical encounter alerts, current options that may be available in Connecticut, planning for procurement, and technical assistance. It is important that Connecticut determines if there are any current systems that can be leveraged to meet the need outlined in the May 2017 environmental scan. Alerts must fit in the various workflows of clinicians and their staff, and integrate seamlessly with other HIE efforts.

Immunization Information System

The HIE will interface with the Immunization Information System to obtain vaccines, vaccinations, and immunization data to support Wave 1 and Wave 2 use cases. This project will involve the design, development, and implementation improvements to the State's systems and exchange of health information to include the DPH IIS, with a key emphasis on reducing the burden on providers while providing critical quality, clinical, and cost data to improve health outcomes.

Public Health Reporting

Connecticut is seeking funding for an implementation of a public health reporting gateway that would facilitate data transport in a consistent and standardized manner. In addition to immunizations, other required reporting will be supported, including syndromic surveillance, reportable labs, and reporting to the cancer registry.

In order to implement a public health reporting gateway, workflow tools need to be implemented that will improve the efficiency and effectiveness of healthcare delivery including the ability to share data bidirectionally with DPH. Activities to fulfill this need include an assessment of the capability of American Public Health Laboratories Informatic Messaging Service to serve as the public health gateway, configuration of the gateway to integrate with systems in place at DPH, communication and onboarding of providers, and monitoring of systems performance.

Image Exchange

The electronic exchange of images across organizations offers providers near real-time access to a patient's history of images, the ability to view and compare images from various locations, and the ability to collaborate with other providers. Improving image exchange efficiencies ensures a reduction in operational costs for connected hospitals and imaging services providers, improves the speed and quality of care delivery, and reduces radiation exposure from unnecessary duplication of imaging.

Image exchange complements the provision of longitudinal health records (clinical health data), offering clinicians enhanced availability of information for clinical decision-making. Connecticut must further define business and functional requirements of an image exchange utility, in order to procure image exchange services from a best-in-class vendor. The state must pursue integration of an image exchange utility with core services such as MPI and provider portal, and manage recruitment of and contracting with health systems, diagnostic imaging centers and physician practices. Healthcare organizations will require ongoing training and technical assistance to share images and establish interfaces with contracted image providers in order to optimize the use of image exchange.

HIE Stakeholder Outreach and Workgroups

Connecticut recognizes the importance of additional stakeholder engagement in order to maximize stakeholders use and participation with the HIE and quality measures. The HIT PMO's approach is to align the stakeholders' business drivers, develop/enhance/refine use cases, and establish value-based implementation priorities. To that effort, HIT PMO will outreach and open communications to the various stakeholder communities to coordinate and facilitate a succession of collaborative workshops. This engagement would also include second tier priority use cases and would seek to convene a work group to engage clinicians and their respective organizations to identify technical, workflow, business specification requirements, and implementation considerations required by the HIE and analytics solution.

The HIT PMO will convene a Clinical Advisory Work Group by recruiting clinicians to serve in the planning and implementation of high value, prioritized use cases for further input, including second tier priority use cases. This workgroup shall engage clinicians and their respective

organizations to identify workflow and implementation considerations required by the HIE for planning and implementation purposes.

The HIT PMO will facilitate domain experts to participate and lead work groups for incremental delivery and testing of HIE services. Domains include but not limited to clinical informatics, healthcare quality and safety, pharmacy, nursing, adult and pediatric care, and long-term care.

Consistent with the strategies set by the Office of the National Coordinator (ONC) and the advice of the HIT Advisory Council, the HIT PMO will use incremental delivery as the process to develop the Statewide HIE. Part of incremental delivery is to build, test, review and validate with stakeholders during the planning process. Using incremental delivery, the HIT PMO team will work with consumers, employers, providers and payers to test analytics, dashboards, and portals of the HIE.

Medication Reconciliation (Med Rec) was identified as a second tier priority Use Case (UC) by the State of CT HIE workgroup. Clinical informatics leaders and pharmacists have initiated the formation of a leadership group to address Med Rec to improve patient safety. The HIT PMO will convene stakeholders who work with prescription medication orders, including healthcare and technical experts, like pharmacists, clinicians, and Chief Information Officers (CIOs) of hospitals. Together, this group will be tasked to enhance and refine a Med Rec Use Case for the State. In addition, the State is making progress on polypharmacy and medication reconciliation and in January 2018 participated in a legislative forum.

This outreach will also include convening experts for the development of the HIE Implementation Strategy within ACOs and hospital systems. Stakeholder outreach will continue further to include an HIE Summit of regional and national speakers to engage and educate state healthcare leaders on best practices and standards. The HIT PMO will inform attendees on Connecticut's HIT & HIE efforts. The key objective of the HIE Summit includes convening healthcare leaders to strategize on HIE deployment within their organizations and/or communities. The education and support provided to state healthcare leaders will encourage adoption and participation in the State of CT HIE.

HIE Support Services and Onboarding Activities

The strength of the proposed Connecticut HIE services is dependent on successful provider onboarding to the HIE shared services and the additional HIE Use Case technologies. In addition to onboarding to the HIE, providers are still in need of help to use their EHRs at a high level so that they can continue to attest to Meaningful Use starting in 2018. There are many reasons that providers don't leverage the full capabilities of their EHRs – cost, staff training, technical complexity, etc. Providing technical assistance that helps providers and their staff redesign workflow, implement "train the trainer" programs, and help cover onboarding costs, including interfaces, for the HIE, increases the return on investment for both EHRs and HIE participation.

Even when options for sharing healthcare data between providers at different organizations is facilitated by a common EHR vendor and shared HIE services, providers expressed limited ability to utilize these services, understand how to retrieve data from another organization, or

integrate that data effectively into their clinical workflow. In addition, there is widespread belief that the actual technical setup for HIE services at each organization is often lacking due to knowledge, skills, and resources available to the IT staff. Technical assistance services coordinated with SIM, DPH, and resources experienced in workflow redesign and quality improvement activities will ensure services are delivered in the most efficient and effective manner

Achieving widespread adoption of health information exchange and analytics in Connecticut is going to be crucial to the overall success of the HIE services. Broad outreach will focus on establishing trust and understanding in the services provided and among stakeholders. The adoption and technical assistance strategy will be multi-pronged, occurring in phases. Once onboarded, technical assistance for HIT and business processes will be offered.

At the beginning of the first implementation year, we will conduct statewide outreach, education, and training on how to use available HIE and analytic services. We will accelerate the process by leveraging relationships with provider advocacy groups, trade organizations, and other stakeholder groups who can help spread the word. Targeted outreach will begin with eligible providers that are currently participating in the Medicaid EHR Incentive Program and those who may have been eligible but did not start participation prior to the 2016 program year. Medicaid HITECH 90/10 funds will fund and support all Medicaid providers with which eligible providers want to coordinate care (State Medicaid Director (SMD) letter #16-003 dated February 29, 2016).

Developing and implementing a strategy for provider onboarding for HIE services will begin immediately, paying close attention to aligning efforts for all of the HIE services that may cross state agencies and stakeholder groups. Onboarding will include behavioral health providers, long term care providers, substance abuse treatment providers, home health providers, correctional health providers, social workers, etc. The first stage of onboarding for the eCQM use case will occur with accountable care organizations with established relationships with OSC who demonstrate the most readiness to participate.

Technical assistance (TA) to providers will focus both on user training on technology usage, as well as TA related to privacy and security, work flows, and business processes. Technology usage training and support will be a continual process as more pieces of the solution become available. Demos of new implementations will occur, as new features are created and need to be demonstrated to stakeholders. Online webinars and videos, FAQs, a forum/chat for users to talk to each other, and an online chat with help desk (with screen sharing capability) may be available in a user accessible portal, connected directly with the user's access to the solution.

Technical assistance with business processes will use proven methods of workflow redesign and leverage existing technical assistance programs to streamline the approach to provider interaction, including SIM's Community & Clinical Integration Program. We will also build on proven methods of TA from the Regional Extension Center (REC) program to ensure continued EHR adoption and use, HIE adoption and use, public health reporting, and use of quality measures and analytics. Much like the REC program, milestones and goals may be created and

monitored on a regular basis. Resources may also be offered to users for needed IT and related expenses, such as interfaces. .

Recommendations for Policy, Regulatory and Legislative Changes and Other Initiatives to Promote the State's Health Information Technology and Exchange Goals

The OHS and the HITO will review and monitor any proposed or enacted legislative changes related to P.A. 16-77 and June Special Session Public Act 17-2. The OHS will pursue policy, regulatory and legislative changes as needed based on the HITO's recommendations and with the advice of the statewide Health IT Advisory Council.

An area of consideration for the 2018 session concerns the All Payer Claims Database (APCD) and feedback regarding its data release process. Acknowledging the Federal requirements pertaining to the use and release of Medicare and Medicaid data, current APCD statutes may overly restrict what data can be released, diminishing the usefulness of the APCD data base. The OHS through the HITO seeks to collaborate with legislators to reexamine data restrictions.

As a consequence of broad stakeholder outreach, there is evidence and a great deal of support for Connecticut to capture immunization records across an individual's lifetime. The Department of Public Health (DPH) is in the process of upgrading their Immunization Information System (IIS) and processes to comply with the Centers for Disease Control (CDC) requirements. These requirements include bi-directional exchange and immunization transactions. The OHS through the HITO plans to address these concerns for capturing lifetime immunization information in a future legislative session.

Appendix A: Health IT Advisory Council Membership

Health IT Advisory Council

	Appointment by	Name Appointment Date	Represents
1.	**Statute**	Allan Hackney	Health Information Technology Officer or designee
2.	**Statute**	Joe Stanford (5/11/17) for Comm. Roderick Bremby	Commissioner of Social Services or designee
3.	**Statute**	Michael Michaud For Comm. Miriam Delphin-Rittmon	Commissioner of Mental Health and Addiction Services or designee
4.	**Statute**	Cindy Butterfield (4/17/17) for Comm. Joette Katz	Commissioner of Children and Families or designee
5.	**Statute**	Cheryl Cepelak for Comm. Scott Semple	Commissioner of Correction or designee
6.	**Statute**	Vanessa Kapral (7/08/16) Comm. Raul Pino	Commissioner of Public Health or designee
7.	**Statute**	Dennis C. Mitchell (03/16/17) For Comm. Jordan Scheff	Commissioner of Developmental Services or designee
8.	**Statute**	Sandra Czunas For Comptroller Kevin Lembo	State Comptroller or Designee
9.	**Statute**	Mark Raymond	CIO or designee
10.	**Statute**	Robert Blundo (03/22/17) For James Wadleigh	CEO of the CT Health Insurance Exchange or designee
11.	**Statute**	Mark Schaefer	Director of State Innovation Model Initiative Program Management Office or designee
12.	**Statute**	Dr. Bruce Metz	CIO of UCHC or designee
13.	**Statute**	Ted Doolittle	Healthcare Advocate or designee
14.	**Governor**	Kathleen DeMatteo 02/19/2016	Representative of a health system that include more than one hospital
15.	**Governor**	David Fusco 03/09/2016	Representative of the health insurance industry
16.	**Governor**	Nicolangelo Scibelli 01/19/2016	Expert in health information technology
17.	**Governor**	Patricia Checko 01/19/2016	Healthcare consumer or consumer advocate

Health IT Advisory Council

	Appointment by	Name Appointment Date	Represents
18.	**Governor**	Robert Tessier 10/8/2015	An employee or trustee of a plan established pursuant to subdivision (5) of subsection (c) of 29 USC 186
19.	**President Pro Tempore of Sen.**	Robert Rioux 9/20/2016	Representative of a federally qualified health center
20.	**President Pro Tempore of Sen.**	Jeannette DeJesus 07/31/2015	Provider of Behavioral Health Services
21.	**President Pro Tempore of Sen.**		Representative of the Connecticut State Medical Society
22.	**Speaker of the House of Rep.**	Lisa Stump 11/22/2016	Technology expert who represents a hospital system
23.	**Speaker of the House of Rep.**	Jake Star 11/17/2016	Provider of home healthcare services
24.	**Speaker of the House of Rep.**	Open	Healthcare consumer or a healthcare consumer advocate
25.	**Majority Leader of the Sen.**	Patrick Charmel 11/30/2015	Representative of an independent community hospital
26.	**Majority Leader of the House of Rep.**		Physician who provides services in a multispecialty group and who is not employed by a hospital
27.	**Minority Leader of the Sen.**	Joseph L. Quaranta, MD (Co-Chair) 7/22/2015	Primary care physician who provides services in a small independent practice
28.	**Minority Leader of the House of Rep.**	Alan D. Kaye, MD 8/24/2015	Expert in healthcare analytics and quality analysis
29.	**President Pro Tempore of Sen.**	Dina Berlyn Designee	President Pro Tempore of Senate or designee
30.	**Speaker of the House of Rep.**		Speaker of the House of Representatives or designee
31.	**Minority Leader of the Sen.**	Jennifer Macierowski Designee 8/20/2015	Minority Leader of the Senate or designee
32.	**Minority Leader of the House of Rep.**	Prasad Srinivasan, MD Designee 8/10/2015	Minority Leader of the House of Representatives or designee
33.	**Health IT Advisory Council Co-Chairs**	Open	Health IT Advisory Council Co-Chairs Appointee
34.	**Health IT Advisory Council Co-Chairs**	Open	Health IT Advisory Council Co-Chairs Appointee

Health IT Advisory Council

	Appointment by	Name Appointment Date	Represents
35.	**Health IT Advisory Council Co-Chairs**	Open	Health IT Advisory Council Co-Chairs Appointee
36.	**Health IT Advisory Council Co-Chairs**	Open	Health IT Advisory Council Co-Chairs Appointee

Appendix B: Biographies of HIT PMO

Allan Hackney
Health Information Technology Officer

Allan is an outcome-driven, people-oriented leader recognized for developing and executing pragmatic strategies that drive growth, improve efficiency and control risk. He serves as Connecticut's Health Information Technology Officer, a role he was appointed to by Lt. Governor Nancy Wyman to develop and coordinate the implementation of a state-wide health information technology strategy, and to build and operate a health information exchange.

Previously, Allan served as SVP & Chief Information Officer (CIO) at John Hancock Financial Services with oversight of the company's technical teams. In this role, he introduced mobile computing and the first company-wide customer data repository. As a catalyst for change, he created shared services and optimized vendors, generating millions in free cash flow to reinvest in new functions and capabilities.

Allan joined John Hancock from AIG Consumer Finance Group where, as CIO and Operations Executive, he led the effort to reposition autonomous banking and lending operations into a more integrated global platform to enable significant expansion. Previously, he was SVP of IT for Bank of America Commercial Finance.

Allan started his career at GE, where he held a number of leadership positions in the USA and Japan for GE Capital's global consumer finance business, led more than 50 global IT due diligence and M&A integration transactions, and headed GE Capital's initiative to launch Six Sigma across its IT function.

Allan was named a Computerworld Premier 100 CIO during 2012, and is a Mentor in Columbia University's Technology Management Masters program. Professionally, he also holds CISM and CRISC certifications.

In the community, Allan co-founded the Boston region and is a member of the Board of Directors of buildOn, a national non-profit organization that empowers youth is to break the cycle of poverty, illiteracy and low expectations through service and education. He is also on the Board of Directors for Common Impact, the national leader in developing tomorrow's leaders through skill-based volunteering and community engagement.

Allan graduated with a Bachelor's degree from Colgate University. He and his wife, Jane, reside in New Canaan, CT and Boston, MA

Alan Fontes
HIT Director, Solution Architect

Alan is an Analytics and Information Management (AIM) Solution Architect with over 30 years of experience designing innovative solutions to empower businesses with the information and insight they need to make data-driven decisions. He has developed innovative solutions to improve the population's health status and wellbeing through outcomes-based analyses that have been used to enhance the efficacy of program services and guide the quality of health and human services delivery, migrating from a purely reactive cost-based model to a proactive preventable event management solution.

Alan has provided leadership to organizations and held executive level positions as Chief Information Officer (CIO), Chief Operations Officer (COO), and Managing Partner of managed care and advanced analytics organizations. He has worked with State and Federal government agencies, national healthcare payers, managed care organizations, integrated healthcare delivery systems, and service contractors in the areas of data governance, master data management, data transformation and integration, advanced analytics, clinical groupers and stratification models, business and clinical intelligence (BCI), information visualization and delivery, business process design, and solution integration.

In addition, Alan has served in the United States Army for over 30 years, where he has provided the leadership for military deployments and global operations to include a chief operations officer for the mobilization of forces in support of Overseas Contingency Operations, including OPERATION IRAQI FREEDOM and OPERATION ENDURING FREEDOM.

Thomas Agresta MD, MBI
Professor and Director of Medical Informatics Family Medicine
Director of Clinical Informatics - Center for Quantitative Medicine
Section Leader for Informatics Connecticut Institute for Primary Care Innovation

Dr. Agresta is a seasoned family physician, educator, administrator, researcher and innovator with a history of bringing together multidisciplinary teams to focus on developing novel methods for creating, using and evaluating technology in both clinical and teaching settings. He has a bachelors in biomedical engineering from Stevens Institute of Technology, a medical degree from New Jersey Medical School, and a masters in biomedical informatics from Oregon Health Sciences University. He oversees the Electronic Medical Record for the Family Medicine Residency Clinic, and has held state-level leadership roles in adoption and implementation for Health Information Exchange and Electronic Health Records. Dr. Agresta is also the section leader for Informatics in the Connecticut Institute for Primary Care Innovation, a joint venture between the University of Connecticut and St. Francis Hospital. He has research interests in using technology to enhance the care of patients, as well as the experience and efficiency of providers.

Sarju Shah, MPH
Project Manager

Sarju is a public health professional with over ten years' experience in project management and multi-stakeholder initiatives. Currently, Sarju provides project planning expertise and management support to achieve advancements in the adoption of Health IT and health information exchange. In her position, she works with teams to develop actionable reports, policy recommendations, and technical assistance. Sarju has worked at the Department of Public Health and the University of Connecticut Health Center, securing over $40 million in grant awards for a broad array of public health initiatives – including obesity, chronic disease prevention, maternal health and Health IT. Sarju received a bachelor's degree and a master's degree in public health, healthcare management and epidemiology from Boston University.

Jennifer Richmond, LCSW, CHC
Senior Program Manager, Health Information Exchange

Jennifer Richmond is a member of the HIT PMO and will oversee the implementation of the state HIE. Jennifer has 18+ years of experience in the healthcare field, including the management of three end-to-end EHR implementations, having also led the information technology, quality, clinical, and compliance functions. She has worked in various settings, including private non-profit community settings and hospitals. Jennifer comes to the HIT team from a long career at Clifford Beers Clinic, where she held many leadership roles, including Compliance and HIPPA Privacy Officer, Director of Health Informatics and Information Management, and Director of Quality Improvement. She is a Licensed Clinical Social Worker (LCSW) and holds a Certification in Healthcare Compliance (CHC).

Dino A. Puia
Program Manager, HIT Project Management Office

Dino is a 25+ year IT professional who has worked in the Insurance, IT Consulting and Healthcare fields. Dino's most recent position was leading various delivery teams at MassMutual Insurance Company, supporting their Distribution, Compensation & Recognition, Post Issue, Broker Dealer and 3rd Party Distribution areas. Dino has also lead other application systems development/operations teams, engineering and infrastructure functions while at MassMutual. Prior to that, Dino worked for the consulting firm PRT Group Inc/enherent Corp providing application development for various clients utilizing on-shore, near-shore and off-shore contracting services and resources. At the start of his career, Dino worked for Aetna Life Insurance Co with a focus on the Aetna Health plans business where he was the Co-Designer of their HMO Administrative System conversion strategy when Aetna merged with US Healthcare in 1996.

Kelsey Lawlor
Stakeholder Outreach Specialist

Kelsey Lawlor is a Project Specialist for the Office of Health Information Technology, with a focus in Stakeholder Outreach and Communications. Previously, Kelsey has served in the administration of Lt. Governor Nancy Wyman, where she gained experience in policy research and analysis and constituent services, with a particular interest in healthcare policy innovation. Kelsey holds a Masters of Public Policy from the University of Massachusetts Amherst.

Kate Hayden, MPH | Health Information Exchange Project Coordinator
Center for Quantitative Medicine | UConn Health

Kate Hayden, MPH is a public health professional with over 10 years of experience working in grant writing, strategic planning, development, research project coordination, and the tracking and evaluation of programs. She has extensive experience and aptitude for working on health projects using technologies. In her current position, she works as the Health Information Project Coordinator at the Center for Quantitative Medicine, UConn Health. Current work includes: medication reconciliation projects, coordination of health information technology events, and supporting health information technology/exchange work for the state of CT.