BUSINESS PLAN 3.0

HSX 3.0

May 2018
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1.0 Executive Summary

HealthShare Exchange (HSX) believes it is imperative that its strategy and direction undergo periodic reevaluation to ensure that its products and services remain valuable to its service community and to evaluate its role in supporting the delivery of health care among participating entities. To that end, HSX leadership has developed Business Plan 3.0 with guidance from the HSX governance committees to achieve its mission and vision:

**Mission:** HealthShare Exchange will provide secure access to health information to enable preventive and cost-effective care; improve quality of patient care; and facilitate care transitions.

**Vision:** HealthShare Exchange envisions a trusted community of healthcare stakeholders collaborating to deliver better care to consumers in the greater Philadelphia region.

Regional statistics were taken into consideration during the planning process, as the HIO continues to gain momentum in the greater Philadelphia region. Philadelphia, the sixth-largest metropolitan area in the country, and the most populous in Pennsylvania, ranks below-average in terms of health status. These statistics are detailed within the Business Plan. HSX leadership has also expanded its business and technology principles to guide decision-making for new products and services to be developed and implemented within the horizon of this plan. The plan covers strategy for products and services associated with HSX and all related business areas:

1. **HIE**
   This business plan capitalizes on the strengths of the HIE’s unique model and continues all existing products and services with plans for member and geographic expansion to cast a broader net for obtaining and sharing authorized patient information while retaining a neutral, non-profit independent status. Four major HIE goals are defined within the plan: 1) recruit and engage across the healthcare continuum; 2) engage membership to adopt all HSX products and services; 3) expand HSX products and services to adjoining geographic service areas; and 4) continue to build HSX’s financial stability.

2. **Population Health**
   With the transition from fee-for-service to value-based care models, HSX recognized the need to expand its services to support Population Health initiatives. HSX offers controlled and authorized access to more robust population level data with the goal of improving overall patient outcomes in addition to individual health. Four major goals are defined within the plan: 1) successful program development and implementation providing data aggregation and reporting services starting with CPC+; 2) become a preeminent population health authority for the community; 3) build the technical capabilities to become a leader in population health; and 4) develop a sustainable business model with ongoing revenue streams.
3. **Innovation, Research & Development (IRD)**

A new HSX branch has been established for Innovation, Research and Development (IRD). The goal of the Innovation, Research, and Development branch of HSX is to stimulate transformative initiatives promoting efficient solutions that will support all business areas of HSX. It is intended to span across all business areas of HSX and to be tasked with 1) ensuring that HSX retains its competitive nature within the industry and 2) fostering the development of novel products and services and initiatives by leveraging existing community assets to enable innovation (i.e., HSX Market Street). The operations of the innovation branch would include, but not be limited to: advisory services; strategic consulting; technological development; and optimization of current products and services/operations. The governance for the IRD is through the Innovation Committee, whose members are subject matter experts representing industry and membership needs. The Innovation Committee will guide the Innovation, Research, & Development branch of HSX with the optimization of pilots, initiatives and projects related to innovation. The Innovation Committee will advise the HSX Board of Trustees with the forward direction of HSX and the health information exchange industry.

The planning process includes evaluation of the organizational structure and resources necessary to support this business plan and has established a more robust structure and aligned responsibilities to meet the objectives of this plan in both products and services and member and geographical growth. The plan has evaluated the data requirements to meet its objectives and now includes a data acquisitions strategy for 2018 and beyond.

The plan also considers its role in Inter / Intra State and National Data Sharing Strategies.

The plan also continues and expands its privacy and security programs commensurate with HSX’s role as steward of the many information assets. HSX’s recent HITRUST certification is just one example of HSX’s commitment to its strong privacy and security programs.

Currently, HSX’s HIE business area financial sustainability model includes the following:

- An annual fee paid by founding health system, hospital, and health plan members
- Annual fees paid by non-founding members based on the services they use

Membership fees are set to cover the cost to onboard a new member as well as ongoing operations and support costs. HSX has been very successful in recent years leveraging state-facilitated grants made available by CMS to cover contracting, testing and implementation costs. That said, HSX is now grant independent and can get creative in the use of grants to help incent and accelerate on-boarding to HSX.

**HSX Financial Sustainability Principles Include:**

- Changing “No Charge” Principle to a “Charge” for Direct Secure Messaging of New Independent Ambulatory Practices – The PD Has Value;
• Continue to Subsidize All Service Costs of City Health Clinics and FQHCs (as long as grants continue);
• Maintain Three Months of Operating Expense Reserve
• Annual Fee to New Members to Support Overall Operating costs of the HIE;
• Begin to Leverage Reserves to Manage Founding Member Fee Increases.

Financial Sustainability and fees strategy for the other business areas including population health and innovation (i.e., MarketStreet), are to be determined as more is understand of those business areas and the needs of the community.

2.0 Business Overview
In order to enable health information sharing across the greater Philadelphia region, HealthShare Exchange took an approach that was very different from that of other Health Information Organizations (HIOs). Its model is unique across the country and is gaining momentum as it continues to expand its service value and geographical coverage.

Greater Philadelphia:
• is the sixth-largest metropolitan area in the country; 1
• is the most populous region in the state; 2
• ranks below average in terms of health status; 3
• has the highest poverty rate of 25.8% among the nation’s ten most populous cities -- nearly twice the national rate of 14%. 4

Available public funding has typically been directed to critical short-term public health needs rather than long-term investments.

Listed below are some regional statistics to consider as the HIO continues to gain momentum in the greater Philadelphia region:

• Philadelphia ranks seventh (7th) in the nation for highest percentage of uninsured adults at 13.6% and eighth (8th) highest in the nation for uninsured children at 3.9%. 5

1 Philadelphia Department of Public Health – 2017 Health of the City – Philadelphia’s Community Health Assessment
3 Philadelphia Department of Health – Community Health Assessment – Philadelphia – December 2016
5 Philadelphia Department of Public Health – 2017 Health of the City – Philadelphia’s Community Health Assessment
• Medicaid and the Children’s Health Insurance Program (CHIP) provide health and long-term care coverage to more than 2.9 million low-income children, pregnant women, adults, seniors, and people with disabilities in Pennsylvania.  

• Many working Philadelphians are uninsured without public or private health insurance. As a result, financial margins of hospitals and providers are relatively low, again resulting in limited funding for HIE investment.
  
  o Despite thin margins, many regional hospitals continue to provide care free-of-charge to patients. In 2017, acute care hospitals provided more than $300 million dollars’ worth of uncompensated care – an increase of more than 20% from 2007.

• The region maintains a striking diversity and complexity of provider entities, including 12 large multi-hospital health systems. More than 50% of the primary care providers (PCP) are employed by health systems. Despite the number of resources, Philadelphia is unlike other major metropolitan areas in that no dominant health system or other community organization has been in a position to gain the consensus of all stakeholders and fund the start-up costs for such a complex undertaking as HIE. This healthcare landscape became a critical focus in forming the HSX HIO to address information sharing among the transitions of care between provider entities.

• The region is a high utilizer of health care. Philadelphia national rankings follow:
  
  o 1st in the nation for highest:
    ▪ Premature cardiovascular disease
    ▪ Infant mortality rate
    ▪ Child mortality rate (<18 years)
    ▪ New HIV
  
  o 2nd in nation for highest:
    ▪ Adult hypertension

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6 Medicaid.gov – Medicaid and CHIP in Pennsylvania – January 2018
7 Philadelphia Department of Health – Community Health Assessment – Philadelphia – December 2016
- Adult diabetes
- Adult obesity
  - 6th in nation for highest:
    - Individuals rating their health poor or fair
- Pennsylvania also ranks among the highest states for illicit or prescribed pain medication (Figure 1), and the opioid epidemic in Philadelphia is among the highest in Pennsylvania at 59.4/100,000. (Figure 2) \(^8\)
- The region is highly specialized. There exists a 4:1, Specialty Care Physician:Primary Care Physician ratio.
- Despite this high use of healthcare, the quality of care is average in the Philadelphia region.
- With regard to patient volumes, no single health system dominates the market.

\(^8\) DEA Philadelphia Division and the University of Pittsburgh – Joint Intelligence Report – Analysis of Overdose Deaths in Pennsylvania 2016
HSX took a very different approach in forming the HIO. Given the above regional statistics, and the community level of trust and commitment, a new HIO model was created and implemented for the region. Listed below are some of the unique characteristics of the HSX HIO model:

- **Health Plan Members.** Health Plans financially support the exchange and also contribute data in the form of the clinical portion of claims data, PCP-patient attribution, and patient-active eligibility status.

- **Financial Sustainability Model.** HSX has developed a financial model based on annual subscription fees and fees to cover costs to both onboard and maintain a new member organization. HSX will pursue grants but is not dependent on grant funds to sustain itself. See the Financial Sustainability section for more detailed information.

- **Start Simple and Offer High-Value Products and Services.** HSX’s early products and services were low-cost and high-value. HSX offered Direct Secure Messaging (DSM) and functioned as a Health Information Service Provider (HISP). HSX soon offered “Enhanced” Direct messaging as a way to 1) automatically send valuable information to an emergency department based on admissions and 2) send valuable clinical information to a patient’s PCP once discharged. HSX soon followed this capability with its Encounter Notification Service (ENS). The ENS enables patient tracking and notification to care team specialists and providers.

- **Stay with Workflow whenever Possible.** The clinical community advised HSX to deliver this new and valuable information within the clinician’s daily workflow. As a result, many of HSX’s products and services are provided within the EMR and can be accessed directly from the EMR; there is no need to go to a separate portal to access information.

- **Remain a Neutral Party with Non-Profit Status.** HSX was created by the community as a non-profit 501(c)(3) entity and is member-owned and directed. HSX is independent; it is not controlled by a single health plan or health system. Its community membership includes the entire continuum of care.

- **A Community Asset.** HSX has developed a set of assets to be leveraged by the community that includes 1) the ability to both push and pull information via Direct to more than 10,000 providers and growing; 2) a repository with data on 6.5 million patients and growing; 3) a legal framework to enable health
information sharing; and 4) a vested community that is represented by its Board of Trustees; several committees; and workgroups to evaluate and direct the priorities and future business direction for HSX.

The current HSX Mission and Vision is as follows:

**Mission:** HealthShare Exchange will provide secure access to health information to enable preventive and cost-effective care; improve quality of patient care; and facilitate care transitions.

**Vision:** HealthShare Exchange envisions a trusted community of healthcare stakeholders collaborating to deliver better care to consumers in the greater Philadelphia region.

Historically, HSX’s approach and philosophy was to identify and augment the gaps in patient-level data that exists within the health care provider community in treating its patients and members. HSX recognized that many member entities had made significant investments in their own health care IT; however, they only had patient information as it related to treatment within their own respective enterprises. These gaps are especially prevalent during transitions of care among disparate providers and health systems. HSX targeted its products and services toward closing those gaps by sharing patient information among and between HSX members and participants. HSX will stay the course with this approach and philosophy by continuing to evaluate the patient data gaps that exist in the health care community and to further develop its products and services toward filling those gaps. Members are able to leverage available products based upon their specific needs. As such, some of the HSX members have leveraged all HSX products, while other members have leveraged selected products.

The graphic below depicts the HSX journey and focus on health IT investments from its early formation years through current and future investment plans. HSX products and services have allowed for the accumulation of massive amount of patient/member-level data within its Clinical Data Repository (CDR). The CDR provides the foundation for many new products and services. HSX will continue to evaluate these opportunities as massive amounts of data become available for each patient/member through 2020.

The graphic title “Reverse Evolution of HSX” is meant to describe how HSX’s HIE foundation will allow for focus to expand to the uses of big data and analytics for its service community. The graphic draws reference to expanding the CDR with many new data types and a transition to “big data” supporting products and services beyond those that are standard in a typical HIE, including population health and other innovative products that may be developed through HSX Market Street.

**Reverse Evolution of HSX**

Direct → ADT → CCDs → CDR
At the time of HealthShare Exchange’s inception, key stakeholders agreed not to rush to create a Clinical Data Repository (CDR) of health data. These stakeholders believed that they had all of the data they needed to treat their patients, and they also believed that they knew where their patients were being actively treated. However, once Admission, Discharge and Transfer (ADT) data began to flow to HSX from its members, HSX was able to provide information necessary for stakeholders to realize that the patients they treat also go to many other providers and healthcare entities to seek care. This revelation was key to members’ support for an HSX Clinical Data Repository (CDR). It further helped with the stakeholder-expanded adoption of HSX products and services and, therefore, an increase in HSX’s value in the community. HSX’s evolution in supporting the healthcare community included a series of products and services that were targeted to meet the needs of approved use cases. Below is the list of products and services in the order of their development, adoption and deployment to HSX member stakeholders, along with some of the planned future endeavors:

1. Direct Secure Messaging and Provider Directory Services
2. “Enhanced” Direct Secure Messaging
3. Encounter Notification Service (ENS)
4. Query Data Exchange/Clinical Data Repository
5. Population Health
6. Research
7. Innovation Hub and Enabler – HSX’s “MarketStreet”

### 2.0.1 Business Principles Subset

Given the new capabilities described above, HSX has developed a set of guiding principles to support its decision making and to ensure that its investments in new products and services are consistently bringing value to the HSX community while maintaining its financial viability through demonstrated return of investments. HSX also developed a set of Technology Principles in Section 6.1 to further guide its decision-making in new products and services. These Business Principles follow:

**HSX Shall:**

- Engage founding members to ensure, where possible, that there is demonstrable ROI for new products, platforms, and service offerings to be deployed and provided;
HSX must understand the landscape to make sure objectives align with the value proposition for providers, health plans and patients;

- Seek both external stakeholders and internal subsidies to seed the start-up cost for Market Street initiatives;
- Act to enable the goals health plans and health system members need to accomplish, while respecting investments that they have already made or committed;
  - Maintain a working knowledge of member business and technology roadmaps;
  - Evaluate opportunities to promote improved patient adherence and engagement with new care protocols;
- Develop new products, platforms, and service offerings, each as a business line with business plans and funding models for each;
  - Evaluate potential use cases for behavioral health information and integration opportunities;
- Ensure that each business line is responsible for its respective product/service contributions to meet HSX strategic objectives;
- Maintain personal relationships with the healthcare community;
- Identify methods for keeping patients engaged.

2.1 Member and Geographic Growth
HealthShare Exchange continues to expand its membership. As of May 2018, this includes entities in both Pennsylvania and New Jersey which, as of March 2018, includes entities in Pennsylvania and New Jersey:

- 45 acute care hospitals/health systems;
- The owned physician practices of these 45 hospitals/health systems;
- Three specialty hospitals;
• Six health plans: Aetna Inc.; Aetna Better Health; AmeriHealth Caritas; AmeriHealth NJ; Health Partners Plans; Independence Blue Cross;
• Six behavioral health organizations;
• Seven Accountable Care Organizations;
• 110 independent ambulatory practices, including Federally Qualified Health Centers (FQHCs) and the City of Philadelphia’s health care clinics;
• 51 Post-Acute Care facilities;
• Three Home Health Agencies;
• One Clinically Integrated Network;
• One Population Health Service Organization.

In order to expand the participation of entities across the continuum of care, HealthShare Exchange’s member recruitment efforts in 2017 focused on the post-acute care network. In addition, HealthShare Exchange has worked to engage entities in Southern New Jersey and in those Pennsylvania counties that are contiguous to Southeastern Pennsylvania. Additionally, HealthShare Exchange has worked to recruit new Medicaid managed care organizations as well as those national health plans with beneficiaries who receive care in the region and across the Commonwealth of Pennsylvania.

In 2018, HealthShare Exchange is also focusing on contracting with non-clinical organizations and community service providers. Recent examples include: the YMCA; Benefits Data Trust; and MANNA, which can provide non-clinical social determinants of health data that could assist HealthShare Exchange members to manage complex populations. HealthShare Exchange also seeks to engage large employer groups that may want to invest in data exchange on behalf of their employees’ health and wellness.

The following map reflects the geographical location of the contracted entities to-date and further reflects the significant penetration in HSX’s service area. The legend to the Map follows: A-Independent Ambulatory Practices; B- Behavioral Health Organizations; H- Hospitals and Health Systems; L- Post Acute Care Organizations; P-Health Plans.
3.0 Governance and Committee Structure

The decision-making process for HealthShare Exchange is based on HSX community involvement and guidance. Committees and workgroups have been established by the community to support, approve and direct activities of HSX. The Governance Structure is further defined in the Participation Agreement that was executed with Founding Members, which governs community-wide data sharing. The Agreement outlines the permitted purposes for data sharing, which includes treatment; care coordination; health care operations; payment; public health; population health; and prevention. As part of this Agreement, the HSX community decided that research would be approved on a case-by-case basis. In addition, the HSX community determined that any new use cases would be approved through a specific and agreed-upon use case governance process. Therefore, all treatment and non-treatment use cases are reviewed in accordance with the established use case governance process. (Refer to Appendix E.)

Below is a graphic of the current committee and workgroup structure.

A detailed description of HSX appointed committees is provided in the table below.
<table>
<thead>
<tr>
<th>Committee</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>Executive</td>
<td>The Executive Committee shall have the power to transact business of the Corporation with respect to emergent issues, compensation and regulatory and governance matters during the interim between meetings of the Board of Trustees. The Committee shall address issues related to the Corporation’s compensation programs to ensure that compensation and benefits of all employees are reasonably related to performance and are in compliance with all applicable rules, regulations and guidance promulgated by the IRS. Additionally the Committee will advise the Corporation, or work with professionals, to advise the Corporation on legal and regulatory issues including compliance, governance and formation and policy preparation.</td>
</tr>
<tr>
<td>Finance &amp; Audit</td>
<td>The Finance &amp; Audit Committee will be responsible for developing the Corporation’s financial policies, reviewing the management of the Corporation’s investments, assisting the Treasurer in developing annual budgets, developing the Corporation’s audit and compliance policies, make recommendations to the Board regarding selection, retention and termination of the Corporation’s independent auditors, reviewing and making recommendations to the Board as to the approval of the Corporation’s audited financial statements and annual IRS Forms 990, and other related duties as may be prescribed by the Board of Trustees from time to time.</td>
</tr>
<tr>
<td>Nominating</td>
<td>The Nominating Committee shall prepare a slate of Trustees and Officers to be considered for election at the annual meeting of the Board in order that, in accordance with Article II, Section 2(a), the Board at all times is comprised of the cross-section of regional healthcare stakeholders outlined in the Corporation’s Bylaws.</td>
</tr>
<tr>
<td>Technical Standards</td>
<td>The Technical Standards Committee will be responsible for advising and recommending of technology and technical standards for the Corporation on matters related to the Corporation’s technology implementation, including, but not limited to, the design and specifications for the Corporation’s Health Information Exchange use cases, including future upgrades and enhancements thereto, and will assess the Corporation’s progress in accomplishment of its objectives.</td>
</tr>
<tr>
<td>Clinical Advisory</td>
<td>The Clinical Advisory Committee shall be comprised of clinical and other expertise to design, evaluate and prioritize meaningful use cases on behalf of the Corporation. Members of the Clinical Advisory Committee may include providers, clinical practices, and others with varying degrees of interest. The Committee will be a resource to the Corporation and clinicians and will be responsible for advising and recommending standards for the Corporation on clinical matters.</td>
</tr>
<tr>
<td>Committee</td>
<td>Description</td>
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</tr>
<tr>
<td>Innovation</td>
<td>The Innovation Committee is comprised of subject matter experts representing industry and membership needs. The Innovation Committee will guide the Innovation, Research, &amp; Development branch of HSX with the optimization of pilots, initiatives and projects related to innovation. The Innovation Committee will advise the HSX Board of Trustees with the forward direction of HSX and the health information exchange industry.</td>
</tr>
</tbody>
</table>

4.0 Business Focus and Direction

4.1 Supporting Organizational Structure

The team that has been put in place at HSX was designed to achieve the growth and potential outlined in the Business Plan. The culture and team approach at HSX is a balance of formality as appropriate but is also flexible, agile, and informal for learning, collaboration, and career growth opportunities, while engaging in a true transformational endeavor such as HealthShare Exchange.

The team is small and prides itself on delivering very meaningful results that provide high value to HSX community stakeholders and to the patients they serve. This organizational structure enables HSX to continue to build on its strengths; preserve its culture; and positions HSX for further growth as it develops new business areas and service value to the community at large.

The organizational structure will support cross-training; identify successors to key roles; provide focus and attention to key risks; and provide foundational principles to enable continued growth as an organization. This structure is further designed to mitigate major business risks, including cyber threats; security data breaches; technology performance and scalability; increasing Epic; TEFCA uncertainty; P3N agenda and merger & acquisition activity.
4.1.1 Enterprise Project Office

One of the key changes in the revised organization structure is the formation of an Enterprise Project Office (EPO) that works collaboratively across all business areas with internal and external stakeholders to identify, prioritize, and execute projects that are aligned with HSX strategic goals. The EPO team is comprised of Project Managers and Engagement & Adoption staff. The EPO is augmented with support from technical subject matter experts and also includes senior leadership participation to ensure that the business goals of HSX are being met while achieving project-specific goals and objectives.

In its daily work, the EPO focuses on:
- Completing project deliverables on time;
- Leveraging available tools to accurately report on project status to more effectively manage staff resources and foster transparency across the HSX team and HSX community;
- Increasing participant engagement and adoption of HSX products and services;
• Identifying opportunities for continuous improvement through regular review of processes and project outcomes;
• Developing and adhering to best practices for both internal use and across the HSX community.

The EPO plans to refine project prioritization processes later in 2018 to better align with, and manage to, the internal, external, and Market Street project pipeline for 2019.

4.2 HSX Business Areas

4.2.1 Health Information Exchange (HIE)

4.2.1.1 HIE Background
HSX HIE business areas include several products and services that began in Q4 2014 as a Health Information Service Provider (HISP), including NextGen’s (Mirth) Direct Secure Messaging (DSM) to its members via HSX’s Provider Directory. Both of these use cases were implemented to address the need for improved transitions of care in the community. HSX later leveraged health plan data to help auto-route information as patients were admitted and discharged from an Emergency Department of one of the member hospitals. This resulted in “Enhanced DSM”.

In October 2014, HSX released a Request For Quote (RFQ) for Encounter Notification Services (ENS), Clinical Data Repository (CDR), Master Patient Index (MPI), and Interface Engine and selected NextGen (Mirth) and Ai to provide these services in January 2015.

HSX has since been deploying the HIE services on these products to the membership and has enhanced its modular API-based capabilities over time to improve the value of the services.

4.2.1.2 HIE Strategic Plan Goals
HSX recognizes the value that its HIE products and services brings to its members and is committed to building on its HIE capabilities. The following chart reflects an overview of the goals and strategies of the HIE Strategic Plan for 2018-2020. Product and service descriptions and recommendations follow the chart.
4.2.1.2.1 Leveraging HSX HIE For Value-Based Care and Alternative Payment Models

Connectivity of electronic health information and interoperability of health information technology is a critical priority nationally supporting the goals of the Triple Aim. As ever-evolving methods of reimbursement become the “new normal” for providers within the broader HSX community, it will become increasingly important for these organizations to fully understand the applicable programmatic and IT requirements.

In order to excel in any or all of the programs described in the paper found in Appendix F “Leveraging HSX HIE For Value-Based Care and Alternative Payment Models” requires a health IT strategy and products that can support the increased levels of care coordination and focus on quality measurement that the programs necessitate.

HSX is well-positioned to meet the current and future clinical data exchange and management needs for its members, as the HIE services that are offered today can be leveraged to be better informed about the care that patients receive from a variety of sources.
HSX’s ability to notify providers about patient encounters in a timely fashion; its ever-growing Clinical Data Repository that can be tapped to reconcile longitudinal patient information; and Direct/Provider Directory services that facilitate the necessary point-to-point communication required to improve care coordination can have a positive impact on the health of populations; how patients experience healthcare received; and, ultimately, on how healthcare costs can be controlled. As such, HSX HIE may be leveraged to support federal programs such as Meaningful Use, Comprehensive Primary Care Plus (CPC+), Accountable Care Organizations, Episode Payment Models, Health Enterprize Zones (HEZ), Delivery System Reform Incentive Payment Programs (DSRIP) and Value-Based Care. All of these programs are described within Appendix F along with a cross-reference to the specific supporting HSX products and services from those described below.

4.2.2 HIE Products and Services

4.2.2.1 Direct Secure Messaging (DSM) and Provider Directory (PD)
- Expansive Provider Directory – Over 10,000 Direct Addresses - a White Pages Directory for the Membership
- Supports Bidirectional Communication Between Trusted Sources
- HISP Services for Members EHR’s

4.2.2.2 Encounter Notification Service (ENS)
- Allows patient subscriptions for notification for members who have presented to an Emergency Department or who have been admitted to an inpatient facility or long-term care facility.
- Real time ENShare portal access to encounters with integration with the CDR for a complete view of the patient’s longitudinal clinical record.
- SmartAlerts that allow for the customization of what triggers a notification and the content that is sent to the subscriber

4.2.2.3 Automated Care Team Finder (ACTF)
- Automated Care Team Finder leverages health plan Primary Care Provider (PCP) attribution and patient subscriptions to deliver discharge summaries to more PCPs.

4.2.2.4 Clinical Activity History Service (CAH)
- Leverages the health plan encounter data and Clinical Data Repository (CDR) of recent clinical history about patients to assist emergency service providers and specialists in clinical assessments.

4.2.2.5 Clinical Data Repository (CDR) and Master Patient Index (MPI) Services
- Secure access from the Members’ Electronic Health Record to a centralized repository of health information from multiple hospitals, ambulatory, post-acute care, and providers in the trust community.
- Also offers Provider Portal access and Health Plan Portal to a longitudinal clinical record for treatment and care coordination purposes.
- Health Plans could use the CDR for HEDIS reporting through the HSX Health Plan Quality Reporting Service.

4.2.2.6 Emergency Response Support Services
- Patient Location and Family Reunification Service during an emergency or crisis response – UPAL (Urgent Patient Activity Liaison).
• Provide the ability for members to access the patient’s longitudinal record in the event of EHR system failure or incident.

4.2.3 HIE Recommendations
• Continue implementation of the HIE products and services to current and new members of HSX that include all the above capabilities
• Continue to acquire data from the entire health continuum that can complete the longitudinal clinical record and join that with the non-healthcare data sources.
• Look for new ways to provide the right information to the right person in real time that has significant value
• NextGen is scheduled to release the next major version of its product suite of Mirth Results 3.0 in Q4 2018. HSX will evaluate the path forward and review alternative approaches for the CDR and MPI if necessary.

4.3 Population Health
With the transition from fee-for-service to value-based care models, HSX recognized a need to expand its services to support Population Health initiatives. HSX offers controlled and authorized access to more robust population-level data with the aim of improving overall patient outcomes in addition to individual health. The following chart reflects an overview of the goals and outcomes/deliverables of the Population Health Plan for 2018-2020, which are still under development and are offered in draft status.
HSX supports Population Health through the use of HSX data for purposes of characterizing or defining a group or class of patients. Population Health refers to an approach to improving the health outcomes of an entire population. HSX data allows for populations to be defined in a variety of ways based upon defined objectives. Examples may include where they receive care; how they are insured; their diagnoses (e.g., people with hypertension or diabetes); where they reside; or other personal or demographic attributes.

Population Health analyses might inform improvements in clinical care, community/social services and public health. The health of individuals and populations is shaped not only by the healthcare received but also by social determinants of health. Consideration of circumstances in patients’ communities can be used to create best practices for prevention, treatment, and healthy living.

In general, for Population Health initiatives that are non-research initiatives, HSX data can be used to support the following:
- Disease or health risk monitoring;
- Outbreak investigations;
• Population health management;
• Population health assessments or community health needs assessments;
• Public health reporting;
• Program evaluation;
• Performance management and prevention services.

It is important to note that, based on HSX’s contract with its participants, HSX data cannot be used for the following purposes: market analysis; research; comparative ranking; provider benchmarking; tiering; or steering.

HSX’s member community approved the Participant Population Health Use Case, which is designed to allow data to be accessed and used, in accordance with the HSX’s policies and procedures and parameters set forth in the HSX Participation Agreement and Business Associate Agreement, to identify patients with whom HSX participants have a treatment relationship or members who are attributed to them, who have unmet needs. This could include the need for routine care or screening or for individualized support required in complex patients at high risk which would allow the participants to reach out to these people to ensure their needs are met.

In addition, HSX’s member community approved the Public Health Authority Population Health Use Case to allow for access to data for community health, public health, and population health missions of the Philadelphia Department of Public Health and the Pennsylvania Department of Health. These both meet the definition of a “Public Health Authority” legally authorized to access and use Data for Public Health purposes and activities as permitted by both HIPAA (i.e., 164.512(b)) and other Applicable Law.

HSX has the following mechanisms available for providing access to data for population health purposes:

• **Extraction of Historical Data**: Uses the HSX template to extract encounter or individual level data in an unaggregated format.

• **HSX-generated and Custom Reports**: Reports are provided upon request based on the full scope of the request. Requestors can choose from multiple options for delivery.

• **Participant-subscribed Reports**: Another type of custom report that that can be run on a daily, weekly, monthly, or quarterly basis.

• **Dashboards (Live Data)**: Provides a visual representation of the data in real time. Based on a monthly subscription fee, users can access dashboards available on the HSX secure site.

Requests for data for Population Health purposes should be submitted to a member of the HSX Management Team for review and approval. Although HSX is in the process of developing its financial model to support Population Health endeavors, financial requirements for access to data for Population Health purposes is
currently determined on a case-by-case basis in concert with the HSX Executive Committee and the HSX Finance & Audit Committee.

**4.3.1 Comprehensive Primary Care Plus Program (CPC+)**

HSX was selected as the data aggregator for the CPC+ Program by Aetna and Independence Blue Cross (IBC). This contract has a five-year term, where in the first year the scope is limited to claims-based measures selected by the payers. HSX is contracted with Onpoint to augment HSX capabilities to meet the CPC+ reporting requirements. Onpoint is a leader in supporting CPC+ initiatives throughout the country. HSX will aggregate claims data from Aetna and IBC and enable reporting of eCQM-based measures from claims data for both the health plans and the CPC+ participating practices. Through this program, HSX will:

- Provide quarterly aggregate reports to Aetna and Independence Blue Cross, including trends for the participating practices on a pre-defined set of claims-based measures. The reports are segregated by Payer, such that each Payer only receives aggregated data for its specific membership.
- For the HSX-contracted practices of the 218 CPC+ Participating practices, reports will be made available through a secure portal that allows for drill-down capability, as well as the ability for practices to configure a dashboard to meet their specific needs.

The scope will be reevaluated by the health plans and their contracted data convener in concert with HSX. In addition, at the time of this writing, CMS is in a selection process to provide data to several additional regions across the nation. HSX is working with Deloitte and CMS to engage CMS for the HSX service region. CMS and Deloitte are currently performing an assessment of HSX capabilities to meet their objectives.

**4.4 Innovation, Research & Development (IRD)**

The goal of Innovation, Research & Development (IRD) is to stimulate transformative initiatives to support efficient solutions that will support all business areas of HSX. The IRD plays a critical role in the innovation process; it is an investment in technology and future capabilities that will be transformed into new products, processes, and services. This investment is an important aspect for HSX in order to remain competitive in the changing healthcare market. Building upon research and development, innovation extends beyond new product development into product renewal, solutions architecture, the design of new processing technologies, and much more.

The IRD business area of HSX is intended to span across all business areas of HSX and to be tasked with (1) ensuring that HSX retains its competitive nature within the industry and (2) fostering the development of novel services and initiatives. The operations of the innovation branch would include, but not be limited to, advisory services, strategic consulting, technological development, and optimization of current services/operations. The HSX Innovation Committee will begin to meet toward the end of 2018 to develop a business plan for IRD that expands beyond Market Street and Population Health and meets the above-stated goal.
4.4.1 MarketStreet

Background

The concept of MarketStreet is to empower consumers with secure access to their health information on their terms. The mission for MarketStreet is to become the trusted innovation platform for healthcare information access and consumer empowerment.

Consumers should have the ability to easily view their clinical data record, i.e., lab results, medications, immunizations, and more. They should also be able to download and share their full clinical record with anyone that they choose. Planned enhancements would give consumers the capability to provide “No Wrong Door” access to their personal health records housed with different providers in HSX’s coverage area. This will enable several capabilities, including providing care coordination and management alerts for patients, families and caregivers; the capture of consumer-supplied data such as Advance Directives/Medical Orders for Life Sustaining Treatment (MOLST); in-home monitoring; social determinants of health and health risk assessments.

Market Drivers and Innovation Challenges

Paradigm Shifts Supporting the HSX Innovation, Research & Development Approach

Patients are now significantly more informed about their health care than in decades past. They are advocating for increased access to their healthcare records, largely stemming from the personal access desired by younger demographics and the caregiver access desired by older demographics. Family members, as critical members of the care team, want better access to health information to support their care efforts. This is very much evident in the home care industry.

Federal programs, realizing the benefits of having a more informed healthcare consumer, have supported efforts which include some aspect of data sharing directly to the consumer. Examples of such programs include:

- The Meaningful Use 3 specific support of APIs to involve patient access within mobile platforms;
- The CPC+ and MACRA programs supporting the use of device data. (MACRA, the Medicare Access and CHIP Reauthorization Act of 2015, is U.S. healthcare legislation that provides a new framework for reimbursing clinicians who successfully demonstrate value over volume in patient care.);
- Other CMS funding opportunities.

These programs typically value application access over portal access of data for the ease of the healthcare consumer (see section below concerning the Legal, Privacy, and Security Framework).

Throughout the consumer experience, there has been a shift toward the most convenient technology, application, and user interface. This is exemplified with the transition in consumer use from personal computers to a tablet; from websites to a mobile application; from desktop data storage to cloud data storage. As consumers value using their own workflows, the data being transmitted is done in a more transparent fashion to facilitate better experiences for the consumer. The drive for easier access to previously siloed information has stimulated the development and use of API-FHIR structures to support the transactions. (Application Program Interface - Fast Healthcare Interoperability Resources). API-FHIR is an HL7 standard for Restful Interfaces. The amount of data about an individual’s health and healthcare has grown exponentially over recent decades, and continues to do so. That data is no longer just in clinics and hospitals, but comes from an increasing number of sources. “Interoperability” used to mean connecting two or more systems. Now, it means accessing data in multiple
systems from one point, one client, in real time. FHIR is the technology that will allow us to see all of an individual’s health and healthcare data in one view.

**Value Proposition**
MarketStreet will leverage community assets already developed by the HSX HIE business area to enable and accelerate innovation across the region. These assets include:
- A legal framework
- Connectivity
- Physical Data
- A vested community (i.e., Committees and a Membership)
- A Provider Directory
- A network of connected Providers and Health Plans

By adding an application programing interface (API) layer over the HSX data repository, the health information is optimized for a multitude of use cases. The technology is complemented by having established relationships with the healthcare entities in this region that support innovation. The current environment and infrastructure are poised to allow stakeholders to access health information relevant to their respective target markets and to deliver specific solutions to address consumer needs.

**Challenges for Innovation**
There are significant challenges for innovation within this region which include:
1. A lack of venture capital funding for this region;
2. The funding streams for innovation that originate outside of this region;
3. The siloed structure of innovation hubs within the HSX membership and the lack of communication;
4. The lack of a legal framework to cover the entire region (HSX has already completed work in this sector);
5. The cost barrier to connect and access data with health systems, including the lengthy contracting cycle limited hospital resource available for innovation projects.
MarketStreet Technology & Business
MarketStreet services will include:

- Application programing interfaces (APIs- custom and FHIR-based) that facilitate seamless and secure data sharing on a HIPAA compliant HITRUST certified platform with multiple data protection layers. Data is exchanged in real-time at a faster pace. It allows for limited delay in receiving or extracting information. The processing is autonomous and easy to manage. It makes information readily available on all devices, mobile or immobile for applications within and beyond the healthcare field.

- A Sandbox and developer tools allowing developers to build and test applications or enhance their applications or services using test patient records. Patient generated data may be integrated for activity trackers, clinical devices and popular mobile apps that can be even outside healthcare domain.

- Business development support that includes partner and vendor evaluation, organizing hackathon events to promote innovation and access to 7M patient’s data through the HIE network, once a product is vetted and approved.
• Advisory services that can help payers, providers, research organizations, and healthcare vendors navigate the complex challenges related to interoperability, data aggregation, analytics/reporting, MPI management and innovation.

Legal, Privacy and Security Framework
In order to be successful, HSX MarketStreet needs a well-established legal, privacy, and security framework. Helen Oscislawski LCC, the HSX HIPAA attorney, investigated the matter and developed a memorandum detailing the legal support for HSX MarketStreet in which she noted the specific legislation supporting individual access of electronic health information (EHI)/protected health information (PHI) and alignment with HSX MarketStreet. The specific related legislation is as follows:

• ONC Draft Trusted Exchange Framework (released January 5th, 2018)
• MU3 - Patient Electronic Access to Health Information (August 2017)
• MITA 3.0 – Medicaid Information Technology Architecture (March 2012)
• HITECH Act of 2009
• 21st Century Cures Act (Secretary of HHS)
• HIPAA
• HIPAA Privacy and Rules

Thus, HSX, having BAA agreements with the HSX Membership, must comply with all HIPAA Privacy and Security Standards and will need HSX membership support and approval. This will be achieved through the HSX governance process. An individual/consumer access to their own Personal Health Information (PHI) stored within the HSX Clinical Database Repository is allowable under HIPAA and deemed necessary to be in alignment with ONC and HHS Policies. All of this is contingent on the establishment of the appropriate technological, administrative, and physical safeguards which would be, at a minimum, the patient portal security safeguards that HSX members currently have. This implies that the authentication and accurate verification of a consumer’s identity and obtaining consent occurs prior to the release of information.

Sustainability and Revenue for MarketStreet
HSX MarketStreet has been evaluated to be considered a “two-sided platform”. Platforms are any entities that require two groups of customers to generate a stream of revenue. Two-sided platforms arise in situations where there are externalities and in which transactions costs prevent the two sides from solving this externality directly. The platform provides a technology for solving the externality in a way that minimizes transaction costs. HSX MarketStreet was given a decided advantage with access to the Clinical Database Repository, which provides a unique window of opportunity to attack the market head-on following rapid development of an API/interface and security features that allow vendors selective access to data.

The specific transaction costs that will decrease through the application of HSX MarketStreet are:
• A reduction in cost of doing business for vendors
• An implementation cost related to connecting with multiple entities
• The technical and commercial challenge of getting patients to aggregate health data by themselves
There are multiple ways to monetize upon MarketStreet that include multiple revenue streams. The Market Street Revenue Stream can be adapted according to vendor, consumer, and payer/provider interests:

- **From the Innovator Directly:** by being able to lower the costs of business through Market Street Strengths (directly impacting the above costs of doing business), the innovator or vendor would be able to contribute to Market Street gains
- **From the Consumer:** If vendors have free access to HSX Market Street, the direct consumer purchases the solution from the vendor with a portion of the revenue contributing the HSX Market Street business operations.
- **From the Payer/Provider:** If better care and value is proven to yield reduced expenses on behalf of payers and providers, the respective entities contribute to HSX Market Street for the services provided.

### 5.0 Inter/Intra State and National Data Sharing Strategies

#### 5.1 Background

The HSX membership commenced with a unique model that included both health plans and health systems/hospital members working together to share data and promote better patient care. The membership has been built on trust, and as the progress of data sharing and exchange has increased, so has the level of trust increased. This unique health plan-provider model has served HSX well as a neutral and independent entity where both health plan and providers participate and trust that HSX will:

- Serve the members’ needs;
- Be the steward of the region’s health data;
- Deliver value-added services to better care for the patients it serves.

This model has enabled HSX membership to continue to grow and expand by attracting new health plans, health systems, hospitals, ambulatory providers, accountable care organizations and post-acute care entities to join the HSX membership. The geographic position of HSX has enabled expansion beyond Southeastern Pennsylvania into other parts of PA; eastward into South Jersey; and into parts of Delaware due to strong patient volume from New Jersey versus a weak patient overlap from the central and western PA direction.

Given recent health plan and health system merger and acquisition activity impacting the region, HSX will continue to adapt its approach for data sharing within Pennsylvania and into the bordering states of Delaware and New Jersey where many patients are also receiving healthcare. HSX needs to support new data sharing models but must also balance data sharing by maintaining its financial and long-term sustainability.

The sections that follow provide further clarity on HSX’s approach and recommended position on various intrastate and interstate data sharing and exchange scenarios, while also attempting to maintain a strong longer-term financial sustainability model.

#### 5.2 Intrastate Data Sharing Approach and Recommendation

##### 5.2.1 PA eHealth Partnership P3N - Background

In 2015, HSX signed the PA eHealth P3N Participation Agreement and became a member of the statewide HIE trust community. Per this agreement, HSX is considered a very large HIE and as a result, HSX pays an annual
fee for the above services of $156,000. Over the last few years, HSX has been very successful in receiving grant funds from the state through CMS to fund the costs for additional HIE infrastructure and onboarding of entities to the HIE.

Per the P3N agreement, the services provided by the state for HIEs include the following:

- Governance Framework
- Certification Program
- Opt-Out Registry
- Query Services
  - Master Patient Index (MPI)
  - Record Locator Service (RLS)
- Provider Directory (PD)
- Public Health Gateway (PHG)
  - Immunizations
  - Electronic Reportable Labs
  - Cancer Registry
  - Syndrome Surveillance
  - Prescription Drug Monitoring Program (PDMP)
- Help Desk and Support Services
- Service Level Agreements

HSX currently offers statewide Query Services using the P3N via a Query Portal as well as some integration with member Electronic Health Record (EHR) systems.

- Currently, HSX has no health systems connected through their EHR in production. However, there are multiple health systems in test mode at this time, with several planned go-lives later in 2018.
- There are over 300 Query Portal users that include statewide P3N Query Access.

At this time, usage of the Query Services is very low, but HSX believes this will increase with additional production go-lives of Query Access to the HSX Clinical Data Repository and P3N.

5.2.2 PA eHealth Partnership P3N – Future Plan

With the recent absorption of the PA eHealth Partnership Authority into DHS, and without an advisory Board, the direction of statewide exchange has been challenged. As such, the following action items will be resolved and supported as deemed appropriate:

- Reconfirm definition of certified HIO for P3N - An HIO should be regional with independent members and be a legally recognized not for profit;
- Adhere to Data Quality Standards/Requirements (i.e., Insurance segment missing).
- Review and approve document changes as P3N begins a refresh of all agreements and policies;
- Evaluate approach and rules for Data Sharing with P3N HIOs that have entities that reside outside PA;
- Continue to support PHG and access to State registries;
- Continue to rollout HSX member access to P3N query services (2018);
- Beyond 2018, State facilitated grants will be evaluated on a year by year and case by case basis.
5.2.2.1 Statewide Encounter Service – ADT Sharing Accepted Approach

The HSX position on a PA statewide encounter notification service is based on member input and assessment of an approach with the various committees and workgroups discussions with the HSX Board of Trustees; Finance & Audit Committee; Implementation Workgroup; and the Privacy & Security Workgroup. The approach that HSX will take for this service is as follows:

- For Treatment and Care Coordination Only
- Emergency Department (ED) Encounters (ADTs) to Start and Consider and Evaluate Future Expansion of Services (i.e., Inpatient);
- Establish Policy to Address Active Patient/Member Relationship Duration (i.e., 6 months) – Near Term
  - Each HIO Technology and/or P3N to Support Policy – Longer Term
- Ensure Privacy Protections of Self-Pay, HIV/AIDS and any Super Protected Data.

HSX has also requested from the state the use case that defines this service and the transaction report and value this will provide for the patients served.

5.2.3 Health Plan Member Needs for Intrastate Exchange

As previously noted, the HSX model is a unique one that operates as an independent, neutral, non-profit entity which includes competing health systems and health plans. HSX remains as the trusted steward of data sharing for a very diverse membership. HSX is therefore a leading option for many health plans seeking to join an HIE that is not run by a health system or health plan. Today, many current and potential organizations that are part of the PA Community and Health Choices programs are looking for a single HIE to meet their statewide needs for better care and coordination of their members.

To provide statewide support for a health plan member, HSX offer the following services:

- Query Portal Access for clinical longitudinal health history for a member
  - This supports further care coordination
  - HSX also offers Health Plan Quality Reporting HEDIS
- Robust Encounter Notification Service for the Southeast PA Region
  - Hospital Inpatient
  - Hospital Emergency Department
  - Long-Term Care

5.2.4 Health Plan Members - Recommendations

- Continue to offer Portal Access to P3N for Statewide Query of a member’s complete longitudinal view;
- Continue to offer a robust Encounter Notification Service to enable better care coordination;
  - Start with ED only; could expand based on results of ADT sharing initiative and membership approval to proceed.
5.3 Interstate Data Sharing

5.3.1 Delaware

In 2016, the ONC funded a grant opportunity to further enable interstate care coordination through the effective sharing of ADTs. HSX was approached by the Delaware Health Information Network (DHIN) to pursue this grant opportunity. The interstate ADT exchange grant focused on four deliverables:
1. Standardized Contracting Data Use Agreement for Interstate Exchange
2. Provider Directory Exchange
3. Quality Requirements for ADT Exchange
4. Interstate Production ADT Exchange

HSX negotiated the following with DHIN on the scope of the grant:
- Limited to ED Encounters;
- Subscription is for Active Patient Relationship Encounter within the Last 18 Months;
- ADT Encounters Only Use is for ENS;
- Equal Hospitals’ Data Exchange: Six (6) from DHIN and HSX (level and volume needs to be equal);
- Limited Commitment Timeframe;
  - Once grant period expires, HSX will evaluate data sharing volumes and impacts on Membership Services
  - HSX will determine if there is an alternative financial model for sharing more than the initial six (6) hospitals

The grant is due to expire in June 2018 and has yielded about ~$200K in funds to cover HSX costs to promote intrastate ADT exchange. The grant may be extended given the delays in starting the sharing initiative.

5.3.1.1 Delaware - Recommendations

- Continue data sharing per the grant agreement until ~Q3 of 2018
- HSX is renegotiating with DHIN for additional interstate sharing based on HSX member approval;
  - As part of the negotiation, consider different financial arrangement to address differences in data sharing volumes (i.e., DHIN 6 hospital vs HSX 40+ hospitals).
  - Currently, DHIN and HSX each share ADT data for six hospital emergency departments. The DHIN volume of ADT Encounters is greater than HSX encounters by 20-fold due to more Pennsylvania residents treating in Delaware than Delaware residents treating in PA. HSX will turn on more Hospital ED feeds to balance the sharing for now until a direction has been decided.

5.3.2 New Jersey

The New Jersey HIE landscape continues to have many efforts focused on data sharing, but minimal value is being realized by connecting a community of independent stakeholders. This is especially true in South Jersey where there are several different HIE efforts underway at various stages of maturity.

The State of New Jersey Department of Health has contracted with New Jersey Innovation Institute (NJII) to administer the CMS Grant program in New Jersey. There are two onboarding grants that are being rolled out to encourage entities to share leveraging an HIE and meet Meaningful Use transition of care requirements. HSX has now been invited to the grant launch, and the team is currently determining how best to leverage these funds to further data sharing and exchange in New Jersey with a focus in South Jersey. The grant program is based on milestones similar to PA HIE onboarding grant program with monies provided for achieving specific
milestones. The model is slightly different, in that the focus is more on Medicaid-eligible providers to start, and the dollar amounts per milestone are less as compared to PA’s grant program.

5.3.2.1 New Jersey - Recommendation
- Continue to Evaluate NJ Grant Opportunity and HIE Definition
- Review DURSA requirements with the New Jersey Health Information Network (NJHIN) – Initial concern with data and patient group relationships that HIEs are required to send to NJHIN.
- Continue targeted recruiting efforts in South Jersey by leveraging HSX members that have interest in South Jersey.
- NJ Health Plan Recruiting - MCOs initially
- Continue to discuss ways IBC and Horizon Blue Cross could leverage HSX services.
- Focus on Central and South Jersey
  - Recruit Post-acute Care and Ambulatory around interested hospitals
- Implement additional filter for NJ unique state Super-Protected Data (SPD) – Genetic Information;
- HSX will have a single data repository for both NJ and PA patients tagged by state origin given patients are seeking care in both states.
- From a sustainability standpoint, develop a fee model to enable data sharing with contracted members intrastate.
- Consider different financial arrangement to address differences in data sharing volumes (i.e., NJ HIE with five hospitals vs. HIE with 40+ hospitals).

5.3.3 Other State Approaches
HSX will work with other states, i.e., Maryland and New York, as they request sharing and connectivity. The approach to sharing will be in the same manner as with DHIN and P3N. The principles that HSX has established thus far will be utilized.

5.4 National Data Sharing

5.4.1 The Sequoia Project – eHealth Exchange
- DURSA and legal documents were signed in 2017.
- Testing has been completed.
- Payment is in process.
- Need to identify exchange partners and overlap in patient populations, i.e., snowbirds in Florida, Arizona, South Carolina
- Conduct testing with identified exchange partners:
  - Social Security Administration
  - Veterans Administration
  - HIE’s
  - Health Systems and Hospitals
  - Others
5.4.2 The Trusted Exchange Framework and Common Agreement (TEFCA) – Approach

The TEFCA Framework document can be found at: https://www.healthit.gov/sites/default/files/draft-trusted-exchange-framework.pdf

The Draft Trusted Exchange Framework recognizes and builds upon the significant work done by the industry over the last few years to broaden the exchange of data, build trust frameworks, and develop participation agreements that enable providers to exchange data across organizational boundaries.

The draft TEFCA was published on January 5, 2018. The final release is scheduled for December 2018.

5.4.3 U.S. Core Data for Interoperability

The Federal Government issued the U.S. Core Data Interoperability standard for comment earlier this year. HSX is monitoring the release of a final version of the standards, which will determine its impact on HSX’s data acquisition plan. Refer to Appendix C: “U.S. Core Data Interoperability” for a list of data classes included in their draft.

6.0 Technology Section

The Technology Section provides details of the components of the technology plans for supporting the HSX business objectives. The components of this section include:

- 6.1 Technology Principles Section provides strategic guidance for HSX’s technology decisions and investments;
- 6.2 Technology Roadmap Section provides information on objectives for expansion beyond current HIE DSM, ENS, and CDR services with new HIE opportunities.
- 6.3 Technology Objectives Section describes the technology stack planned to accomplish the objectives outlined in the Technology Roadmap Section.

6.1 Technology Guiding Principles

This section defines the guiding principles for all HSX technology investments and decision-making.

HSX Shall:

- Control its own fate for the technology solutions, implementation, and support
- Build in flexibility and speed to market with obtainable proven technological solutions. Where not obtainable, innovate and build viable solutions;
- Define incremental and achievable deliverables in its approach to technology solutions;
- Look horizontally to see how use cases can be deployed across the HSX community;
- Support the “three-legged stool” connecting providers, care team, health plans, and patients and their caregiver network;
- Maintain a core infrastructure where the current data in HSX is normalized and staged for deployment into other specific data applications;
- Utilize industry standard API’s as a first option where they exist. However, where API’s are not available, either develop API’s or offer portal access to meet the objective;
• Broaden the range of data that includes physical health, behavioral health, and social determinants to provide a holistic view of the patient by establishing and developing a data acquisition plan;
• Be proactive in the exploration and potential use of new innovative technologies.

6.2 Technology Roadmap
The Technology Roadmap covers a rolling three-year time horizon, recognizing that valuable opportunities may arise that could alter the technology path. It is intended that the agreed-upon objectives will be prioritized, with Year 1 objectives being clear and obtainable; Year 2 well defined for further consideration; and Year 3 and beyond somewhat blurred given likely changing priorities and objectives. The technology roadmap is largely dependent on HSX’s Data Acquisition Plan and enhancements to the technology stack, the priorities and technology investments. As such, the technology roadmap and components will be reviewed and approved annually, with potential to add other opportunities based upon key influencers and business drivers. Examples of key influencers include support for Population Health and Innovation Research and Development priorities.

The HSX Technology Roadmap is in direct support of HSX’s next stage of growth as defined within Business Plan 3.0. Historically, HSX’s focus has been squarely on providing HIE services, building out its Direct Secure Messaging (DSM), Encounter Notification Service (ENS), and Clinical Data Repository (CDR), and building on provider engagement and adoption of these services across the region. HSX is committed to supporting and growing these HIE services for a larger community of members and patients.

The following diagram provides a high-level overview of the technology state that was implemented through 2017:

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HSX HIE Roadmap 2015 to 2017

1. Services (API), Visualization, and Reporting Tools
   - Provider Reporting
   - Health Plan Reporting
   - Public Health Reporting

2. Data Contributors Services Layer (HL7, ADT, Labs, C-CDA)
   - Clinical Documents & Messages
   - Longitudinal Health Record

3. Powered by HealthShare Exchange (HSX)
The HSX Business Plan 3.0 expands on those products and services, providing direction for prioritization of new technology-based opportunities in support or enablement of:

- Population Health for Membership and Public Health Authorities Reporting
- Quality Reporting for Health Systems, Health Plans, Ambulatory, and Post-Acute Care
- Behavioral Health while accommodating 42CFRPart II requirements as revised March 21, 2017
- Innovation; Consumers Access to Their Health Information (i.e., MarketStreet)
- Healthcare Digital Home and Remote Monitoring
- Research Efforts
- Emergency and Disaster Recovery Government Services

The following diagram provides a high-level “business” overview of the technology future state. Structured and unstructured data will be consumed into normalized data models. The chart depicts both current and future state products, data acquisition, and supporting technology-based solutions.
The goals, objectives and products defined within this Business Plan are supported through the maintenance and expansion of HSX’s technology platform. This platform is positioned to support five HSX HIE products – the Clinical Data Repository; Government-related Services Health Plan and Provider Reporting; Public Health Reporting; and Population Health – as well as the three HSX Market Street products – Research Mobile, Consumer Provider, and Consumer Access.

These products and services are further supported through the HSX enhanced Data Acquisition Plan and enhancements to the HSX Business Intelligence Layer. HSX will continue to expand the net for obtaining current HIE data acquisition (Clinical Documents, C-CDA and Behavioral Health) and expand its reach into new data sources to obtain information from Health Devices, Healthcare Claims and Social Determinants.
The HSX Business Intelligence Layer is critical to ensuring high quality data for the HSX and Market Street products. The Data Quality and Validation Layer is at the core of the Business Intelligence Layer and is where data is validated before incorporating into HSX data warehouse and repositories. The quality and validator services are supported through both commercial and in-house developed tools. The Business Intelligence Layer ensures HIE standards are met; will provide reporting analytics and data visualization tools; provide data export transformation and load (ETL) toolsets; and provide API’s and FHIR for access and interoperability between HSX data and products.

HSX’s Technology Roadmap is part of a larger technology healthcare community referenced in section 5 into which significant investments have been made at various levels. The objectives of the Technology Roadmap are...
aligned with the needs of the healthcare community by enabling services that are not otherwise possible through the current community. The components of this healthcare community are depicted in the graphic below:

### 6.3 Technology Objectives
The HSX Technology Roadmap supports the above objectives by positioning its technology stack to accomplish these objectives by:

- Supporting HIE expansion beyond Southeastern Pennsylvania going west and north as well as east into Southern New Jersey;
- Developing a high-quality community patient-centered view using physical health, behavioral health, and social determinants by acquiring new data sources in accordance with the Data Acquisition Plan in Section 6.0.
  - Incorporating non-traditional physical health data sources:
    - Behavioral Health
    - Healthcare Digital Home and Remote Monitoring
    - Social Determinates
    - Social Media
    - Consumer Device Data Sources
    - Other Attainable Unstructured Data
  - Establishing a high-quality assurance processes for all data types
- Standardizing the data libraries for coded fields and acceptable values
- Normalizing data around clinical concepts for predictability of patient outcomes and prescriptive care directives
  - Enabling automated real-time clinical decision support
- Promoting and supporting enhanced and more automated care coordination among providers/care team, health plans and patients/care givers
  - Enabling patient engagement and empowerment
- Supporting Population Health and Quality Measure Reporting
- Incorporating technology exploration through the Market Street Channel (pending Business Plan for Market Street)

### 7.0 Privacy and Security
HSX fully recognizes its stewardship responsibilities in maintaining security over the information assets it keeps for the benefit of its members, participants, and the community it serves. As such, HSX has made significant investments in security. This section of the Technology roadmap provides insight into those security features already deployed, as well as those that are in progress or planned. These features include policies, procedures, infrastructure, monitoring tools and third-party security risk assessments.
7.1 HITRUST Certification

Of significant note, HSX actively pursued HITRUST certification with the aid of MedITology in 2017 and submitted all HITRUST required policies, procedures and implementation documentation in Q4 2017. Effective December 30, 2017, HSX received full certification by HITRUST. The business drivers in pursuing HITRUST certification were as follows:

- HSX current annual Risk Assessments were already based on HITRUST Security Controls.
- HSX was seeking a security and risk framework to support and build out a security program.
- HITRUST was an aggregate of ISO, NIST, PCI, HIPAA and state and local regulations combined into one standard.
- HITRUST is becoming a requirement for our members and or future members.

HITRUST key focus is to:

- Increase the protection of protected health and other sensitive information;
- Mitigate and aid in the management of risk associated with health information;
- Contain and manage costs associated with appropriately protecting sensitive information;
- Increase consumer and government confidence in the industry's ability to safeguard health information;
- Address increasing concerns associated with business associate and third-party privacy, security and compliance;
- Work with federal and state governments and agencies and other oversight bodies to collaborate with industry on information protection;
- Facilitate sharing and collaboration relating to information protection amongst and between healthcare organizations of varying types and sizes;
- Enhance and mature the knowledge and competency of health information protection professionals.

The HITRUST certification covers 19 assessment domains:

- Information Protection Program
- Endpoint Protection
- Portable Media Security
- Mobile Device Security
- Wireless Security
- Configuration Management
- Vulnerability Management
- Network Protection
- Transmission Protection
- Password Management
- Access Control
- Audit Logging & Monitoring
- Education Training & Awareness
- Third Party Assurance
- Incident Management
- Business Continuity & Disaster Recovery
- Risk Management
- Physical & Environmental Security
- Data Protection & Privacy

The road to HITRUST certification has helped HSX to strengthen its security program with the alignment and formalization of existing procedures with HITRUST requirements. The new procedures developed and implemented within HITRUST requirements include:

- Incident Response Program
• Business Continuity & Disaster Recovery Plans
• Asset and Inventory Management
• Acceptable Use Acknowledgement
• Vulnerability Policy and Patch Management Plan
• Access Control Procedures

The HSX Privacy and Security Program is led by the HSX Privacy Officer and the HSX Security Officer with guidance from the HSX Privacy and Security Workgroup. Their collective oversight includes:

• Policies, Procedures, Implementation, Managed, and Measured
  o Physical, Technical, and Administrative Controls
  o HITRUST Industry Certification https://hitrustalliance.net
• Risk Assessments
• Incident Response and Management
• Audit and Monitoring
• Security Awareness and Training

7.2 HSX Security Procedures
HSX developed and implemented more than 50 technical security-related procedures. These procedures have all been reviewed with MedITology and approved by HSX. Security Awareness Training is an ongoing process and has been completed for all key staff and they are fully implemented. The table below reflects HSX security procedures at a summary level:
Security Procedure Groups | Procedures
---|---
Access and Data Protection | • Access control
• Continuous Monitoring
• Data Handling, Labeling and Storage
• Data Media Sanitization and Disposal
• Data Transfer Procedures
• Device Encryption and Protection
• Encryption and Securing Devices
• Information Exchange Procedures
• Information Security Management Program
• Mobile Device Management and Protection
• Patient Opt-out / Opt-in
• Password Management
• Sensitive Media Protection
• Virus and Malware Protection
• Virtual Private Network Connections
• Wireless Network Security

Risk Management | • Business Continuity Plan
• Change Management
• Independent Security Audits
• Patch Management Program
• Physical Security and Access Protection
• Security Incident Response Plan
• Security Incident Response Playbooks
• Third Party Review Procedures of Technical Operations
• Vendor Selection
• Vulnerability Management and Assessments

7.3 HSX Infrastructure Investments
HSX believes its security investments are of paramount importance in protecting its information assets from unauthorized access or release of information. Current investments are continuously evaluated as new threats become identified in the industry. HSX’s current security program meets all known industry standards for HIE’s.

This security program starts within the HSX environment and extends to all of its supporting vendors, as the vendor selection process includes validation that strong security program exists. The discussion below focuses on the security infrastructure within HSX, AWS, Mirth, AI and Onpoint.

7.4 HSX Office Environment
The HSX office environment is largely cloud-based, using Microsoft Office 365 for the business productivity, email, and OneDrive for document storage. The security investments summarized in the table below are in addition to the Microsoft cloud service security provisions.

<table>
<thead>
<tr>
<th>Perimeter Protection</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firewalls</td>
<td>CISCO Dual Firewalls</td>
</tr>
<tr>
<td>Automated Network Activity Audit &amp; Monitoring</td>
<td>Dark Trace</td>
</tr>
<tr>
<td>Penetration Testing</td>
<td>Nessa; MedITology</td>
</tr>
<tr>
<td>Mobile Device Management</td>
<td>Sophos (– Anti Virus/ Malware Protection / Web Filtering/ Policy Enforcement and Reporting)</td>
</tr>
<tr>
<td></td>
<td>Office 365 MDM</td>
</tr>
<tr>
<td>Data Management</td>
<td>Protenus (PHI Monitoring)</td>
</tr>
<tr>
<td></td>
<td>Office 365 (Data Loss Prevention &amp; Monitoring)</td>
</tr>
<tr>
<td>Two-Factor Authentication (privileged user access)</td>
<td>Duo</td>
</tr>
<tr>
<td></td>
<td>Google Authenticator</td>
</tr>
</tbody>
</table>

7.5 HSX AWS Data Center Cloud Environment

HSX utilizes AWS for services directly supported by HSX in addition to those supported by Mirth, Ai, and OnPoint. These include maintenance of the Provider Directory, Mirth Connect, Data Archive, De-identified data warehouse, CPC+ SFTP server and Diameter Health. The security investments summarized in the table below are in addition to the AWS cloud service security provisions.

<table>
<thead>
<tr>
<th>Perimeter</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firewalls</td>
<td>AWS Shield</td>
</tr>
<tr>
<td>Intrusion Detection Logging</td>
<td>Guard Duty</td>
</tr>
<tr>
<td>Intrusion Detection System</td>
<td>Trend Micro</td>
</tr>
<tr>
<td>Automated Network Activity Audit &amp; Monitoring</td>
<td>Guard Duty</td>
</tr>
<tr>
<td>Auditing and Audit Trail</td>
<td>Cloud Trail</td>
</tr>
</tbody>
</table>

7.6 Supporting Vendors

The selection of HSX supporting vendors included deep evaluations of their security programs during the selection process. HSX has also implemented penetration testing for externally facing portals. Mirth and Ai have met all HIE industry standards.

HSX is currently contracting with Onpoint Health Data as a partner in the CPC+ program. Onpoint maintains HITRUST certification, and HSX performed a successful penetration test of its quality reporting portal on February 9, 2018, with no security issues noted. Onpoint is also contracted with a third party to perform risk assessments and vulnerability testing.
7.7 Risk Assessments

HSX has performed risk assessment and vulnerability testing on an annual basis since 2015. These assessments are performed by an independent third party and are based on any newly identified threats, material changes in the environments and any new services being deployed. These risk assessments and vulnerability testing are conducted for all vendor environments (Mirth, Ai, Onpoint and AWS). In-scope assessment services include:

• Social Engineering included in 2017
• Security areas covered
  • Based on the HITRUST Framework
  • Network and Infrastructure Security
  • Physical Building Security
  • System Access Security
  • Audit and Monitoring
  • Material Risk Ad Hoc Vulnerability Testing

HSX views its security program as a journey rather than a destination. There is continual review of the security over its information assets. Influencers for program enhancement include new services, new connections with other HIE’s and industry knowledge of newly introduced security threats. HSX will adapt its program to meet or exceed new security requirements.

Annually, HealthShare Exchange develops its goals for the upcoming year in concert with the HSX Privacy and Security Workgroup. These goals are presented to the HSX Board of Trustees and are reviewed on a regular basis. For 2018, the following goals were established:

HITRUST
• Ensure Compliance with HITRUST Remediation Program
• Ongoing Certification Updates for 2018 on Version 9

Network Monitoring and Auditing Software
• Evaluating DarkTrace Product to Monitor HSX Office and AWS Networks
• Will Extend to Other HSX Vendors Where Possible If Effective

Office 365 Privacy and Security
• Working with MedITology on Improving our Protections of Our Business Confidential Information and Technology Suite
• Data Loss Prevention (DLP)
• Mobile Device Management (MDM) 2017

Quarterly Vulnerability Testing
• Will Use 2 Different 3rd Party Security Professionals for 2 Quarters
• Internal HSX Resource for 2 Quarters

Conduct Two Table Top Testing Exercises
7.8 Future Privacy and Security Initiatives
The 2018 HSX Privacy and Security Workgroup’s goals include the following:
• The provision of guidance and feedback on the HSX Audit and Monitoring Program;
• Continued monitoring of Opt-Outs and the improvements in automation of Opt-Out processes;
• Helping HSX to explore additional options for cyber liability insurance coverage and program; and
• Provide, with HSX HIPAA counsel, ongoing guidance related to the handling of Super-Protected Data with the growth of the Clinical Data Repository and the addition of behavioral health providers to the HSX community.

Going forward, HSX will continue to make significant investments in both Security and Privacy rigor and tool sets. Portions of the revenues that the other business areas yield will be used to invest in and improve HSX in these two critical success areas for the organization.

8.0 Data Acquisition Plan

8.1 Data Acquisition Strategy and Plan 2018
The Data Acquisition Plan is developed to support HSX’s goals and objectives outlined within this business plan. The new data is also prioritized for 2018 and beyond based upon importance to the plan, readiness of the community to provide and commercially available technology to obtain and maintain. The implementation of the data acquisition plan is dependent on the availability of data from targeted sources and their ability to meet HSX data quality standards.

8.1.1 Current Products, Services and Data Requirements
HSX products and services are defined below, and the data requirements for each of them are listed below. The current list of data providers supplying data feeds to HSX is provided in Appendix A and also at https://hie.healthshareexchange.org.

Current Products, Services and Data Requirements
• Automated Care Team Finder (ACTF)
• Direct Secure Messaging Address
• Discharge C-CDA Transitions of Care
• Patient Attribution
• Patient Demographics

Clinical Activity History (CAH)
• Direct Secure Messaging Address
• Health Plan C-CDA from Claims
• Insurance
• Patient Demographics
Clinical Data Repository (CDR)
• Consent
• Discharge C-CDA Transitions of Care
• Hospital Admit, Discharge, and Transfer (ADT)
• Insurance
• Lab Reports
• Patient Demographics
• Provider Directory

Direct Secure Messaging
• HISP Services
• Direct Secure Messaging Address
• Provider Demographics

Encounter Notification Service (ENS)
• Direct Secure Messaging Address
• Hospital Admit, Discharge, and Transfer (ADT)
• Long Term Care Admit, Discharge, and Transfer (ADT)
• Patient Demographics

Provider Directory
• Direct Secure Messaging Address
• Provider Demographics

8.2 Data Acquisition Progress 2015-2017

8.2.1 Physical Health

Hospital
• Admit, Discharge, and Transfer (ADT)
• Discharge C-CDA Transition of Care
• Lab Reports

Ambulatory
• Admit, Discharge, and Transfer (ADT)
• C-CDA Visit Encounters

Long-Term Care
• Admit, Discharge, and Transfer (ADT)
• C-CDA Visit Encounters

Inpatient Rehabilitation
• Admit, Discharge, and Transfer (ADT)
Outpatient

- Admit, Discharge, and Transfer (ADT)

Health Plans

- C-CDA from Claims

8.3 Data Quality

HSX has established data quality standards for the data feeds it receives. These data quality standards are noted in section 8.3.1 below along with the tools that HSX utilizes to validate transaction sets in section 8.3.2. HSX utilizes components of ONC’s Patient Demographic Quality Framework to guide its data quality standards. Refer to Appendix B: “ONC Patient Demographic Data Quality Framework”.

8.3.1 Data Quality Libraries

The data quality libraries listed below are utilized to validate the information in the data feeds for each specific field. Below is an overview of the data libraries utilized in the HSX data validation.

**Gender**

- LOINC (Logical Observation Identifiers Names and Codes) is a database and universal standard for identifying medical laboratory observations.

**CDC Race and Ethnicity**

- MVX (The MVX is an alphabetic string which represents the manufacturer of a vaccine.)

**CPT (Current Procedural Terminology)**

- NDC (National Drug Codes)

- CPT is a medical code set that is used to report medical, surgical, and diagnostic procedures and services to entities such as physicians, health insurance companies and accreditation organizations.

- CVX (The CVX code is a numeric string which identifies the type of vaccine product used.)

**HCPS II (HCPCS)**

- NPI (National Provider Identifier is a unique identification number issued to health care providers in the United States by the Centers for Medicare and Medicaid Services (CMS).

- SNOMED (Systematized Nomenclature of Medicine -- Clinical Terms is a standardized, multilingual vocabulary of clinical terminology that is used by physicians and other health care providers for the electronic exchange of clinical health information.)
ICD 10 (The International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM) is a system used by physicians and other healthcare providers to classify and code all diagnoses, symptoms and procedures recorded in conjunction with hospital care in the United States effective 10/1/2015.]

ICD 9 (The International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) was used in the U.S. health system's as the standard list of six-character alphanumeric codes to describe diagnoses and procedures up until 10/1/2015.)

Languages ISO 639-1 (ISO 639 is a set of standards by the International Organization for Standardization that is concerned with representation of names for languages and language groups.)

UNII (Unique Ingredient Identifier (UNII) is a non-proprietary, unique, unambiguous, non-semantic, alphanumeric identifier linked to a substance's molecular structure or descriptive information by the Substance Registration System (SRS) of the Food and Drug Administration (FDA) and the United States Pharmacopeia (USP).

VIS (Vaccine Information Statement is a document, produced by CDC, that informs vaccine recipients – or their parents or legal representatives – about the benefits and risks of a vaccine they are receiving.)

8.3.2 Data Quality Tools
- HSX ADT Quality Scoring Tools
- Diameter Health C-CDA Quality Scoring Tool

8.4 Data Acquisition Strategy 2018 and Beyond
HSX has focused its efforts on the Physical Health data acquisition from 2015 through 2017 and plans to expand its acquisition plan to include additional data from members that have not fully provided this type of data. The execution and implementation of the current data acquisition plan has resulted in a comprehensive Encounters data set. This data set is driving value to the membership through their use of HSX products such as Encounter Notification Service (ENS) and the Clinical Data Repository (CDR). HSX has also been making progress in implementing member-sourced Transitions of Care C-CDA transactions. Given the value of these C-CDA transactions, HSX has established as a top priority the acquisition of C-CDA transactions from all members capable of providing them. HSX has implemented data quality tools to ensure that the C-CDA meets HSX’s high data quality standards so that they are usable for enhancement of the CDR, as well as support for future reporting requirements and use cases.

Data feeds have been prioritized within each section below. Data feeds that are required to complete the acquisition among all members are classified as Priority 1. HSX recognizes that its members are not always capable of providing Priority 1 data feeds at this time. Where those conditions exist, other compensating data feeds will be explored with those members. These data feeds are classified as Priority 2.
8.4.1 Physical Health

8.4.1.1 Hospital

Priority I
- Discharge C-CDA Transition of Care
- Lab Reports
- Radiology Reports
- Quality Measures QRDA

Priority II
- Transcribed Documents
- Image Exchange
- Orders
- Medication Administration
- Scheduling and Appointments
- Functional Status: ADL, Falls Risk
- Food Insecurities Assessments
- Housing Insecurities Assessments

8.4.1.2 Ambulatory

Priority I
- Admit, Discharge, and Transfer (ADT) Encounters
- C-CDA Visit Encounters

Priority II
- Quality Measures QRDA
- Scheduling and Appointments

8.4.1.3 Long Term Care

Priority I
- Admit, Discharge, and Transfer (ADT) Encounters
- Discharge C-CDA Transitions of Care
- C-CDA from Minimum Data Set (MDS) includes Functional Status: ADL, Falls Risk

8.4.1.4 Inpatient Rehab

Priority I
- Admit, Discharge, and Transfer (ADT) Encounters
- Discharge C-CDA Transitions of Care

8.4.1.5 Outpatient

Priority I
- Admit, Discharge, and Transfer (ADT) Encounters
- C-CDA Visit Encounters
• Schedule and Appointments

8.4.1.6 Home Health

Priority I
• Admit, Discharge, and Transfer (ADT) Encounters
• Discharge C-CDA Transitions of Care
• C-CDA from Outcome and Assessment Information Set (OASIS)

Priority II
• Device Data

8.4.1.7 Urgent Care Centers

Priority I
• Admit, Discharge, and Transfer (ADT) Encounters
• C-CDA Visit Encounters
• Discharge C-CDA Transitions of Care

The data acquisition inventory listed below is not sourced from the HSX membership. The priority is dependent upon the establishment of new partnerships and their capability to provide the data, as well as any newly identified business needs (e.g., analytical reporting) that may be dependent upon a new type of data feed in these categories. As new partnerships are established, data acquisition plans will be developed and implemented in concert with partner capabilities.

8.4.1.8 Healthcare Digital Home and Remote Monitoring
• Device Data
• Wearables
• Home Health

8.4.1.9 Pharmacy
• Pharmacy Benefits Manager (PBM’s)
• Institutional Pharmacies
• Prescribed Rx
• Filled Rx
• Dr. First
• Surescripts

8.4.1.10 Dental
• Treatments
• Medicine Rx
• Cancer: Neck and Mouth

8.4.1.11 Vision
• Eye Health
8.4.1.12 Chiropractor
• TBD – data types are not yet identified

8.4.1.13 Whole Health Wellness Centers
Genetics
• 23andMe
• Ancestry.com
Nutrition
• Dietitians
• Food Insecurities Assessments
• Housing Insecurities Assessments
• MANNA

8.4.2 Patient Research Consent
• TBD – data types are not yet identified

8.4.3 Personal Information
• Advance Directives
• Organ Donor

8.4.4 Behavioral Health
• Progress Notes with Consent

8.4.5 Social Determinants
• Housing
• Income and Income Distribution
• Education: Literacy, ESL
• Unemployment and Job Security
• Employment and Working Conditions
• Early Childhood Development
• Food Insecurities
• Drinking Water
• Lead Products: Paint
• Disabilities: Hearing Impaired, Sight Impaired
• Social Exclusion and Inclusion
• Social Safety Network Access
• Gender, Race, Ethnicity
• Mobility: Obesity Rates
• Transportation
• Health Insurance Status
• Substance Abuse: Smoking Rates, Alcohol
• Family History: Mental Health, Substance Abuse
• Religion
• Exercise Facilities Access
• Marital Status
• Child Protective Services
• Senior Protective Services
• Poison Control

8.4.6 Public Health Registries
• PA Reportable Labs (eLR)
• PA Immunizations (SIIS)
• PA Cancer Registry
• PA Syndrome Surveillance
• PA Electronic Clinical Quality Measures (eCQM)
• PA Prescription Drug Monitoring Program (PDMP)
• City of Philadelphia Immunizations
• NJ Reportable Labs
• NJ Immunizations
• NJ Electronic Clinical Quality Measures (eCQM)
• NJ Prescription Drug Monitoring Program (PDMP)

8.4.7 State Programs
• Medical Assistance (Medicaid)
• Children’s Health Insurance Program (CHIP)
• Supplemental Nutrition Assistance Program (SNAP)
• Women Infants Children (WIC)
• Health Alert Network (HAN)
• School Health
• Emergency Preparedness
• BD Trust Services

8.4.8 Health Plans
• Historical Claims Data as C-CDA
• Pharmacy Benefits Manager (PBM)
• CAH Ingested into the CDR

8.4.9 Quality Reporting
• CPC+
• eCQM
• Federal Programs

8.4.10 Population Health
• NCQA and HEDIS Standard Data Source
  • Diameter Health Quality
    o HEDIS Standard Data Source
• De-identification Methods
HSX follows HIPAA Safe Harbor standards of the Privacy Rule Section 164.514(b)(2) for de-identification of protected health information.

8.4.11 Community Facts
- Federal Census Information: https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml

9.0 Financial Sustainability

HSX’s financial model is multi-dimensional and is based on several key tenets that guide and ensure its current and future financial sustainability. HSX’s funding is obtained through member subscription fees and grants. HSX’s funding requirements are presented in an annual budget process for review and approval to its Finance & Audit Committee and to its Board of Trustees.

9.1 Key Tenets
Several key tenets have helped to ensure the financial health of HSX as it has matured from a start-up organization to a mature operating organization with services that bring significant value to HSX’s member stakeholders across the greater Philadelphia region. These tenets include the following:

- Annual Subscription Fees. HSX uses an annual subscription fee model for unlimited use of all HSX HIE services. Each contracted entity acknowledges this model by signing an HSX Participation Agreement at the time it agrees to become a member of HSX and have access to this data. The HSX membership is very diverse; all have agreed to an annual fee for use of HSX services. HSX’s membership includes health plans; providers; ACOs; independent ambulatory and specialty practices; post-acute care entities; long-term care entities; and other entities on the continuum of care.
- Subscription Fee Structure. Given that HSX is a non-profit, community-directed, membership-based organization, the fee structure is based on covering costs and ongoing support of the HIE for the benefit of the entire community. Membership fees include the cost to onboard a new member as well as ongoing operations and support costs.
- Provide Value to the HSX Service Community. HSX products and services bring significant value to its service community by creating an environment of data sharing for the betterment of the patient’s treatment and outcomes. HSX has made significant progress in obtaining data from entities that have the capability to provide data to HSX. This tenet supports a “greater good effect” that enables a more valuable service for all and improves the view of the patient, which results in improved patient outcomes. As such, HSX membership receives a return on its investment and continued financial support of HSX.
- Leverage the HSX Community Asset to its Fullest Potential. This final tenet challenges the healthcare stakeholder community across the region to further leverage HSX’s unique assets created to support the needs of the providers, plans and the patients/members they serve.

9.2 Grant Approach
HSX has been very successful in recent years in leveraging state-facilitated grants that are made available by CMS to cover contracting, testing and implementation costs. HSX is grant-independent today. However, HSX aggressively pursues grants as they become available. Wherever possible, HSX has started to explore creative ways to leverage grants to help cover costs of the on-boarded entities’ connection to the HIE. Given its current
financial health, HSX is now in a position to assist those entities that may not have the resources and support necessary to on-board to the HIE, contribute data where possible, and leverage the value of HSX products and services.

9.3 Budget Cycle and Guiding Principles
As noted above, the HSX annual budget process begins in August. Following Finance & Audit Committee review and approval in October, it is presented to the HSX Board of Trustees for approval at its November meeting. The budget and agreed-upon fee schedule are based on the value of services and level of usage across the region. Since HSX is on a calendar fiscal year, the budget and fee schedule are effective on January 1.

HSX utilizes the guiding principles noted below to support its ongoing financial sustainability model:

- Continue to subsidize all service costs of City of Philadelphia health clinics and Federally Qualified Health Centers (FQHCs) as long as CMS based grants continue;
- Maintain three months of operating expense reserve;
- Set annual fees on a “fair share” basis for all members to support overall operating costs of the HIE;
- Charge for services that provide value to HSX’s membership, including Direct Secure Messaging of new independent ambulatory practices (i.e., the Provider Directory);
- Begin to leverage reserves to help manage Founding Member fee increases.

9.4 Emerging Business Areas
As more information becomes known about the two emerging business areas, a fee structure and approach will be determined for each area. The fees charged for the non-standard services will be based on the cost of providing the service. HSX Participants may be charged an additional fee for receipt of Population Health information disseminated via extraction, generated reports and/or subscribed reports. Likewise, Public Health Authorities may be charged for participation in HSX’s Population Health Services. As this business area matures, more details on fee structure will be provided in a future release of this business plan.

Innovation, Research and Development is a new business function and focus for HSX. In this business function, HSX will provide more focus on exploring new, innovative ways to leverage the data and provide value to the region. The Market Street initiative is one example of this. As this business area matures, more detail on a fee structure will be provided in a future release of this business plan.
10.0 Next Steps – Business Plan 3.0

This section describes the Business Plan direction and approach going forward beyond this version (May 2018).

The next step in the business plan includes the development of a trifold that summarize major aspects of the plan with focus on mission, vision, and value statement with focus on business growth.

At the time of the writing of this plan, the details and next steps on two new business areas, (Population Health and Innovation with focus on Market Street) are only partially completed. The next scheduled release of the Business Plan will be in November 2018 to coincide with the HSX Board and Annual Meeting. The updated release will complete the HSX Business Plan 3.0 and will provide further detail and direction for all business areas for 2019 and 2020.
### Appendix A: Current Data Feeds

Current snapshot as of March 27, 2018. Updated versions are available at: [https://hie.healthshareexchange.org/](https://hie.healthshareexchange.org/)

<table>
<thead>
<tr>
<th>Member</th>
<th>ADT Data Feed</th>
<th>C-CDA Data Feed</th>
<th>Lab Data Feed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abington Jefferson Health Physicians</td>
<td>November 2015</td>
<td>TBD</td>
<td>August 2017</td>
</tr>
<tr>
<td>Abington Jefferson Health Lansdale Hospital</td>
<td>June 2015</td>
<td>TBD</td>
<td>August 2017</td>
</tr>
<tr>
<td>Abington Jefferson Health Memorial Hospital</td>
<td>June 2015</td>
<td>TBD</td>
<td>August 2017</td>
</tr>
<tr>
<td>Abramson Center for Jewish Life</td>
<td>May 2017</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
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Appendix B: ONC Patient Demographic Data Quality Framework

The PDDQ Framework is comprised of five primary categories, illustrated in the figure on the left below. Each category contains a number of Process Areas, 19 in all, illustrated in the figure on the right below. These Process Areas serve as the principal mechanisms to communicate the themes, context, benefits, and example work products of the model, focused around the key evaluation questions contained within each section. Fulfilling practices assists an organization to chart its path and progress in building capabilities.

The PDDQ Framework is structured such that an organization can implement any combination of categories or process areas and obtain baseline conclusions about their capabilities. The organization can focus on a single process area, a set of process areas, a category, a set of categories, or any combination up to and including the entire PDDQ Framework. This allows application to meet specific needs.

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Appendix C: U.S. Core Data for Interoperability

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<tr>
<td>1. Patient name</td>
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<td>5. Race</td>
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<td>7. Smoking Status</td>
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<td>9. Laboratory values/results</td>
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<tr>
<td>11. Problems</td>
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<td>15. Care Team members</td>
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<td>17. Immunizations</td>
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<td>19. Unique device identifier(s) for a patient’s implantable device(s)</td>
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Appendix D: HITRUST Certification Letter

HITRUST letter is included on the following two pages
HITRUST™

Letter of Certification

December 30, 2017

HealthShare Exchange of SEPA,
1801 Market St. Suite 750
Philadelphia, PA 19103

Based upon representation from management as to the accuracy and completeness of information provided, the procedures performed by an approved HITRUST CSF Assessor to validate such information, and HITRUST’s independent confirmation that the work was performed in accordance with the HITRUST CSF Assurance Program, the following organization’s systems and infrastructure meet the HITRUST CSF v8.1 Certification Criteria:

HealthShare Exchange of SEPA - Mirth Results, Mirth Match, Mirth Mail, Encounter Notification System, Data Analytics and Hosting, and HSX infrastructure

The certification is valid for a period of two years assuming the following occurs:

- A monitoring program is in place to determine if the controls continue to operate effectively over time
- No data security breach reportable to a federal or state agency by law or regulation has occurred
- No significant changes in the business or security policies, practices, controls and processes have occurred that might impact its ability to meet the HITRUST CSF certification criteria
- Annual progress is being made on areas identified in the Corrective Action Plan (CAP)
- Timely completion of the interim review as defined in the HITRUST CSF Assurance Program Requirements

HITRUST has developed the HITRUST CSF, a certifiable framework that provides organizations with the needed structure, detail and clarity relating to information security tailored to the healthcare industry. With input from leading organizations within the industry, HITRUST identified a subset of the HITRUST CSF control requirements that an organization must meet to be HITRUST CSF Certified. For those HITRUST CSF control requirements that are not currently being met, the organization must have a CAP that outlines its plans for meeting such requirements.

A full copy of the certification report has also been issued to the organization listed above. This full report includes additional details on the scope of the assessment, a representation letter from management, testing results for those controls required for certification, a benchmark report comparing the organization's results to industry results, details on CAPs required for certification, as well as the completed questionnaire. If interested in obtaining a copy of the full report, you will need to contact the organization directly.
HITRUST™

Additional information on the HITRUST CSF Certification program can be found at their website: www.hitrustalliance.net.
Appendix E: Use Case Governance Policy

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1. Purpose

The purpose of HealthShare Exchange of Southeastern Pennsylvania, Inc. (HSX) Use Case Governance policy is to provide a framework for HSX Use Case development and approval.

2. Scope

This policy applies to HSX Use Cases that are presented to HSX for consideration that are non-exceptional Use Cases. All Treatment and non-Treatment Use Cases that are for Permitted Purposes in accordance with the HSX Founding Member Participation Agreement (“PAR”) shall be reviewed in accordance with this policy by the applicable HSX standing committees, workgroups and the HSX Board of Trustees (the “Board”). When a Use Case is deemed to be for Treatment, all applicable HSX Participants shall contribute and disclose Data to support the Use Case.

3. Policy

All future HSX Use Cases:

- Must be aligned with the approved HSX business plan
- Must be able to be funded in accordance with HSX sustainability plans
- Must be for Permitted Purposes in accordance with the PAR
- May respond to a local or regional need
- Should demonstrate a Return on Investment (“ROI”) for HSX Participants if additional resources are required for implementation
- Must be approved by applicable HSX standing committees/workgroup

- Future HSX Use Cases requires Board approval only when:
  - The new Use Case is for Non-Treatment purposes
  - The new Use Case could result in implementation costs that would exceed HSX budgetary allowance and/or increased implementation or other costs for Participants.
  - The new Use Case proposed services is not contemplated in the approved HSX business plan

- HSX will consider Use Case suggestions that come from staff, the Board, members,
participants, governmental agencies and healthcare professionals.

- Once approved and implemented, a Use Case will be monitored and evaluated for quality, usage, and effectiveness.
- HSX will maintain a record of all proposed Use Cases, regardless of whether or not they are approved.
- Non-approved Uses Cases that utilize Direct Secure Messaging may be implemented by participants where process, infrastructure, and or financial investment by HSX are NOT required.

HSX Participants would be permitted the opportunity to appeal a denial of a proposed new Use Case.

4. Procedures

The following describes the steps that outline HSX Use Case governance process flow:

1. HSX receives a new Use Case proposal and it is reviewed as illustrated by the Process Flow, Figure 1.
2. HSX staff reviews the proposed new Use Case. If needed, HSX staff will conduct outreach and research with constituents and/or the HIE community at large to ensure that the proposed Use Case description is clear and to assess whether or not such a Use Case has been implemented in another HIE community.
3. If HSX staff believes that the proposed Use Case has merit, the Clinical Advisory Committee chair reviews the Use Case proposal.
4. Based upon Clinical Advisory Committee chair’s comments, HSX staff refines the Use Case in preparation for committee reviews and then provides the proposed Use Case to the Clinical Advisory Committee, Privacy and Security Workgroup, and Technical Standards Committee for consideration in accordance with the Use Case review evaluation criteria, Figure 2. Each Use Case is designated as either Treatment or Non-Treatment through the committee/workgroup review process.
5. If there are financial implications to HSX or Participants, the proposed Use Case is reviewed by the Finance and Audit Committee.
6. Ongoing follow up with stakeholders who proposed the Use Case occurs as additional clarification and justification are needed.
7. HSX staff refines the Use Case based on committee and workgroup input.
8. In order for a Use Case to be approved, an affirmative vote of two-thirds (2/3) of the members of each applicable committee and workgroup is required.
9. After the Use Case has been vetted and approved by all the necessary committees/workgroup and does not require Board approval, the Use Case is disseminated to all HSX Participants and posted on the HSX website.
10. For non-Treatment Use Cases that require Board approval, the Use Case as approved by the applicable committees/workgroup shall be presented to the HSX Board for final approval. Prior to presenting the Use Case to the Board, Participants are given a thirty (30) day period to provide final comments on the proposed Use Case in writing to a member of the HSX Management Team(email acceptable).
11. Upon Board approval of a Non-Treatment Use Case, HSX shall provide written notice to all Participants who are of the Participant type described in any non-Treatment Use Case of the approval of such non-Treatment Use Case. Within forty-five (45) days after the receipt of notice from HSX containing the proposed non-Treatment Use Case in sufficient detail so that Participant can make an informed decision as to its participation, Participant may refuse to participate in such non-Treatment Use Case by the provision of written notice to HSX (email acceptable).

12. In the event that a Participant provides written notice of its refusal to participate in such non-Treatment Use Case, the objecting Participant shall meet with HSX and its designees as requested to discuss its objections and any modification to such non-Treatment Use Case that, if made, would resolve the Participant’s objections. If such meeting fails to resolve Participant’s objections, HSX may deploy such non-Treatment Use Case only if it is able to utilize a technological means to ensure that the objecting Participant’s Data is not disclosed or shared for the non-Treatment Use Case. If such a technological solution does not exist and/or is impracticable or too costly to be utilized, HSX shall not deploy such non-Treatment Use Case until such time as Participant’s objections are withdrawn or Participant is no longer a Party to the PAR.

13. Prompt written notice of the denial of any proposed Use Case shall be made to the persons and entities who proposed such Use Case at the applicable stage in the approval process.

14. All approved Use Cases shall be posted on the HSX website.

15. Upon approval, a new Use Case moves into the HSX implementation phase.

16. Participants may appeal the denial of a proposed Use Case by submitting a written notice of appeal setting forth the reasons why such proposed Use Case should be approved and why the denial should be set aside within sixty (60) days of receipt of written notice of the denial. Appeals shall be considered by the HSX Executive Committee.

Figure 1. Process Flow - follows on the next page
1. Stakeholder presents new Use Case idea

2A. Staff Conduct Outreach and Research with Constituents as Appropriate

2 & 3. HSX Staff and Chair of Clinical Committee Review Use Case Idea

4A. Review Technology Feasibility with Technical Committee

4. HSX Staff Develop and Refine Use for Further Review with committees/workgroup

4B. Review use case with Clinical Committee and Privacy and Security Workgroup (determine if use case is treatment or non-treatment)

5. Review and Validate Financial Model and Affordability with Finance Committee (as needed)

6. Ongoing follow-up with stakeholders that proposed the Use Case

1. & 8. In order for a Use Case to be approved, an affirmative 2/3 vote required from all applicable committees/workgroup

9. When all committees/workgroup have approved a Treatment Use Case and no additional resources are needed, move to Steps 14 & 15

10. When all committees/workgroup have approved the Use Case but Board review is required for business, financial, and/or non-treatment use case reasons, move to Step 11

10A. When Board approval is required, HSX provides Participants a 30-day period to provide comments for consideration by the Board

11. Upon Board approval of a Use Case, HSX provides written notice to all affected Participants. Upon Board approval of a Treatment Use Case: Go to steps 14 & 15. Upon Board approval of a Non-Treatment Use Case, when there are No Participant Objections to Use Case, move to steps 14 & 15

12. Refusing Participant will Discuss Objection(s) with HSX. If Discussion fails to Alleviate Objection(s), then the Non-Treatment Use Case only be deployed if Obtaining Participant's Data is Not Used

13. Written notice or denial of any proposed Use Case shall be made to the persons/entities who proposed such Use Case

14. & 15. All approved Use Cases shall be posted on the HSX website and a new use case moves into the implementation phase

16. Participants may appeal the denial of a proposed Use Case via written notice of appeal

11A. A Participant May Refuse the Non-Treatment Use Case in Writing 45 days after Initial Receipt of Notice from HSX
5. Enforcement

The Executive Director has responsibility for oversight of the HSX Use Case Governance process and procedure under the guidance of the Executive Committee and direction of the HSX Board. HSX committee chairs and staff facilitators are responsible for ensuring that Use Cases are properly vetted and approved in accordance with this policy.

6. Definitions

For a complete list of definitions, refer to the Glossary.

7. References

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Appendix F: Leveraging HSX HIE For Value-Based Care and Alternative Payment Models

Leveraging a Health Information Exchange to Maximize Value-Based Care Program & Alternative Payment Model Requirements

A Look at How HealthShare Exchange Service Offerings Benefit Member Initiatives to Support the Triple Aim

July 2017

Jennifer Natale, MPH, FACHE  Jason McNamara, MS
Senior Manager,  Director,
Engagement & Adoption  Health Information Systems
HealthShare Exchange  Audacious Inquiry, LLC
Overview

Connectivity of electronic health information and interoperability of health information technology is a critical national priority supporting the goals of the Triple Aim – quality safe care for patients in accessible, cost effective settings to improve the health of Americans.⁹ During the last decade, the United States (U.S.) has experienced dramatic progress in health information technology’s evolution across the direct care, population health, care coordination and research domains.¹⁰ The national requisite to meet Meaningful Use requirements demanded that hospitals and physicians share data through technology. Early efforts for this type of clinical data exchange revealed the challenge of creating data sharing linkages between diverse entities with disparate electronic health technology platforms.

Born was the Health Information Exchange (HIE), an ‘entity’ enabling the interoperability of automated health data, (that) can facilitate important improvements in healthcare quality and efficiency.¹¹ Various models of HIEs developed nationally – each unique based on the state/regional healthcare markets. Many grew out of state orchestration whereas others were established by clinically integrated health systems and networks; however, regional ‘stand-alone’ HIEs also evolved in mature markets like Southeastern Pennsylvania and Southern New Jersey, where larger geographic clinical data sharing was imperative beyond such networks.

HIEs, such as HealthShare Exchange, currently offer services that can be effectively deployed to support such areas like improving follow-up care post-hospitalization, reducing emergency department utilization, closing gaps in care and enhancing electronic communication between providers. These areas are core elements of the new reimbursement and care models that are being rapidly implemented across the U.S. and present a significant opportunity for provider-based organizations to leverage HIEs to maximize value-based care programs and alternative payment model requirements.

HealthShare Exchange Background

HealthShare Exchange (HSX) is a non-profit HIE and an accredited health information organization (HIO). HSX enables a collaborative and coordinated healthcare environment for its Participants, where availability of patient information across providers and health plans benefits consumers by supporting key clinical decisions, reducing duplicative services, and improving care outcomes.

HSX is a membership driven organization. Its membership spans the continuum of care and while the organization was founded by the Greater Philadelphia region’s thirty-seven hospitals/health systems and three of the region’s health plans, the organization has expanded beyond its primary service area to serve provider organizations in other Pennsylvania counties and into the State of New Jersey. Critical to HSX’s strong sustainability model are HSX members, who contract with the organization through a Participation Agreement, which binds all Participants to regulatory and legal requirements and has helped to create a community of trust, anchored in formal use cases and a robust data security program.

Recent Changes to Healthcare Payment Models to Improve Care

Several historic shifts in healthcare in the U.S. are offering challenges to health information technology. The data-management component of the care system will not only have to keep pace with these changes but help to drive them. Most visible among alterations in the system now is a new paradigm for payments. In order to transition to value-based reimbursement, and away from fee-for-service payments, the U.S. healthcare system is now implementing a number of alternative payment models (APMs). The U.S. Department of Health and Human Services (HHS) has been at the forefront of this shift — setting ambitious goals, for example, for tying Medicare payments to APMs.

By the end of 2016, HHS had met its first goal of having 30 percent of payments tied to an APM. The department’s next goal is to hit the 50 percent mark by the end of 2018. The passage of the Medicare Access and CHIP Reauthorization Act of 2015 (MACRA), modified the way providers are paid by Medicare by tying their payments to quality,

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HSX Business Plan 3.0 - May 2018
whether through the Merit-Based Incentive Payment System (MIPS) track or the Advanced APM track, thus aiding HHS in attaining these goals. Fortunately, concurrent with the roll-out of these heavily data-dependent programs has been a newly expanded and essential emphasis on clinical data interoperability and sharing. Government and non-profit organizations and vendor companies serving healthcare are tackling compatibilities among electronic health record systems (EHRs), as many of the nation’s HIEs are also innovating to serve their respective service areas across the country. HIEs, working in synchrony with EHRs, serve government, providers, payers, researchers, care-management organizations, and of course, ultimately, the consumer, in supporting the new payment models with their need for more information and efficient, effective care coordination. For some, HSX could be a game changer to address these current needs.

**HealthShare Exchange Service Descriptions**

Today, HSX offers an array of services that benefit its members. Services available to provider-based organizations are outlined below.

**Direct Secure Messaging (Direct)**

HSX facilitates the secure routing of clinical information to providers’ direct addresses using the national Direct Project standards — an email-based protocol for confidential transmission of patient health information between trusted entities. Includes sending of continuity of care (C-CDA) documents with discharge information and referrals for transitions of care. HSX provides Direct Messaging services to its members, if needed. Many HSX members use their own EHRs to send and receive direct messages but leverage the HSX Provider Directory to enhance clinical information exchange. Using Direct can also assist with efforts to close the referral loop by providing the technical transport of this information between members’ EHRs and through the distribution of the HSX Provider Directory on a weekly basis. See Exhibit A for the Direct/Provider Directory diagram.

**Provider Directory**

The HSX Provider Directory contains direct addresses for physicians and other healthcare providers who actively participate with HSX. Members leverage the directory to send secure messages containing transition-of-care documents to primary care providers and specialists to update them about care their patients have received. See Exhibit A for the Direct/Provider Directory diagram.

**Automated Care Team Finder (ACTF)**

HIEs, working in synchrony with EHRs, are looking to serve government, providers, payers, researchers, care-management organizations — and of course consumers.
HSX has enhanced the basic capabilities of Direct by engaging its health plan members to identify attributed primary care providers (PCP) for patients; it then uses this information to route C-CDA documents, containing discharge information, to the downstream provider using Direct secure messaging. HSX has experienced that it is challenging for hospitals to accurately capture PCP information, making ACTF an effective way to get clinical information to the right provider shortly after an emergency department visit or hospitalization. See Exhibit B for the ACTF diagram.

Clinical Activity History (CAH)
This HSX service involves the collection of recent clinical history about a patient from the patient’s healthcare insurer, based on the patient’s member identification within the health plan. The health plan then translates this claims/utilization data to a clinical care document — returning this information to the requesting provider or emergency department using Direct secure messaging. The CAH document is particularly useful to providers who have never seen the patient before. It provides necessary information about recent procedures, tests and medications that help the care team understand the patient's history at the point of care. See Exhibit C for the CAH diagram.

Encounter Notification Service (ENS)
Delivers notifications to HSX Participants who subscribe to the service when one of their patients or members is hospitalized or presents to an emergency department or skilled nursing facility. Subscribing entities can also be notified when their patients or members are discharged from these same care settings, allowing for more timely, effective follow-up and outreach. See Exhibit D for the ENS diagram.

Encounter Notification Service for Facilities
Once a hospital or facility supplies Admit, Discharge, Transfer (ADT) feeds to HSX, HSX can automatically subscribe discharged patients for the participating hospital or long-term care/skilled nursing facility. ENS auto-subscription provides notifications back to the HSX Participant about discharged patients who are subsequently admitted within a defined timeframe (e.g. 30 days, 45 days) to another HSX Participant emergency departments, hospitals or long-term care/skilled nursing facility. See Exhibit E for the ENS for Facilities diagram.

Clinical Data Repository (CDR)
Collects and retains medical records data about patients, permitting a patient’s provider or care team to query the exchange and retrieve clinical information. The HSX CDR is a large database of health information that over time is a valuable tool for care coordination, viewing a patient’s longitudinal record across many data sources and population health management. While its primary use is for treatment purposes, inclusive of care coordination, the data stored within the CDR can be leveraged for other services as developed by the HSX community and in accordance with the permitted purposes in the HSX Participation Agreement.
National, Regional, and Local Programs & HSX Service Alignment

Local, regional, and national programs launched in the last few years has moved providers from a fee-for-service payment model to value-based care. The tables below provide an overview of the major programs with which HSX members currently participate and outline the HSX services that can be leveraged to improve the outcomes these incentive programs promote.

<table>
<thead>
<tr>
<th>MIPS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Program Manager</td>
<td>The Centers for Medicare &amp; Medicaid Services (CMS)</td>
</tr>
<tr>
<td>Reach</td>
<td>National</td>
</tr>
<tr>
<td>Program Goals</td>
<td>Base provider payments on a composite score from four categories: quality measures, resource use, advancing care information (formerly Meaningful Use), and improvement activities</td>
</tr>
<tr>
<td>Programmatic Health IT Requirements</td>
<td>In 2017, use 2014 Certified EHR Technology (CEHRT), and in 2018, use 2015 CEHRT. For bonus points in the quality category, use end-to-end electronic reporting of eCQMs. This requires using certified health IT product to record, calculate, and report, or if working with a QCDR/qualified registry, using a standards-based method for sending data from the EHR to the QCDR/qualified registry</td>
</tr>
</tbody>
</table>

| Aligned HSX Services  | • **Direct** messaging assists with Advancing Care Information; providers must be able to send and receive summaries of care**15** |
|                       | • **Encounter Notification Service** to enhance care coordination as one type of improvement activity**16** |
|                       | • **Clinical Data Repository** - Querying data (in C-CDA format) from HSX supports one of the Advancing Care Information measures**17** |
| Additional Critical Success Factors | • Creating and exchanging care plans supports the improvement activity category |

* For at least one transition of care or referral, the MIPS eligible clinician that transitions or refers their patient to another setting of care or health care provider-(1) creates a summary of care record using certified EHR technology; and (2) electronically exchanges the summary of care record

**Establish standard operations to manage transitions of care that could include one or more of the following: Establish formalized lines of communication with local settings in which empaneled patients receive care to ensure documented flow of information and seamless transitions in care; and/or Partner with community or hospital-based transitional care services.

***For at least one transition of care or referral received or patient encounter in which the MIPS eligible clinician has never before encountered the patient, the MIPS eligible clinician performs clinical information reconciliation. The MIPS eligible clinician must implement clinical information reconciliation for the following three clinical information sets: (1) Medication. Review of the patient's medication, including the name, dosage, frequency, and route of each medication. (2) Medication allergy. Review of the patient's

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15 Advancing Care Information. https://qpp.cms.gov/mips/advancing-care-information
16 Improvement Activities. https://qpp.cms.gov/mips/improvement-activities
17 Advancing Care Information. https://qpp.cms.gov/mips/advancing-care-information

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### Medicaid EHR Incentive Program (Meaningful Use)

<table>
<thead>
<tr>
<th>Program Manager</th>
<th>CMS and Pennsylvania Department of Human Services (PA DHS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reach</td>
<td>State</td>
</tr>
<tr>
<td>Program Goals</td>
<td>Promote the use of health IT to improve patient care</td>
</tr>
<tr>
<td>Programmatic Health IT Requirements</td>
<td>In 2017, use 2014 CEHRT, and in 2018, use 2015 CEHRT.</td>
</tr>
</tbody>
</table>
| Aligned HSX Services             | • Direct messaging/Provider Directory enhances provider communication and fulfills Health Information Exchange measure*18  
                                 | • Clinical Data Repository - Querying data (in C-CDA format) from an HIO supports the receive and incorporate measure for Stage 3 Meaningful Use**19 |

*The Health Information Exchange measure requires eligible providers who transition their patient to another setting of care or provider of care or refers their patient to another provider of care provides a summary care record for each transition of care or referral. This needs to occur for more than 10 percent of transitions of care and referrals.

** The eligible provider incorporates summary of care information from other providers into their EHR using the functions of CEHRT.

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## Comprehensive Primary Care (CPC+)

<table>
<thead>
<tr>
<th><strong>Program Manager</strong></th>
<th>CMS with Aetna and IBC</th>
</tr>
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<tbody>
<tr>
<td><strong>Reach</strong></td>
<td>Greater Philadelphia Region</td>
</tr>
</tbody>
</table>

| **Program Goals** | Provide comprehensive primary care and preventive services to complex patients to improve quality and reduce the cost of care. |

| **Programmatic Health IT Requirements** | In 2017, use 2014 CEHRT. Starting January 1, 2018 use 2015 CEHRT. By January 1, 2019, use the following 2015 Edition capabilities: 1) record and report eCQMs ($170.315(c)(1), (c)(2), (c)(3), and (c)(4)); 2) record social, behavioral, and psychological data ($170.315(a)(15)); and 3) create care plans using the C-CDA template ($170.315(b)(9)). |

| **Aligned HSX Services** | **Encounter Notification Service** supports care managers knowing about their patients who are in the hospital and/or present to the emergency department*<br>**Encounter Notification Service** supports reporting overall emergency department utilization for a physician practice** |

| **Additional Critical Success Factors** | Patient risk stratification or risk score assignment for managing a panel<br>Cost of care information for patients<br>Care gap alerts for each patient to ensure appropriate care is provided |

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* CPC+ Track 1 requires under the Care Management function that patients with ED visits receive a follow up interaction within one week of discharge and that contact occur with at least 75% of patients who were hospitalized in target hospital(s), within 2 business days.20<br>** CPC+ Track 1 requires under the Comprehensiveness & Coordination function that providers identify hospitals and EDs responsible for the majority of patients’ hospitalizations and ED visits, and assess and improve timeliness of notification.21

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### Medicare Shared Savings Program (ACOs)

<table>
<thead>
<tr>
<th>Program Manager</th>
<th>CMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reach</td>
<td>Majority multi-state with small number of regional</td>
</tr>
<tr>
<td>Program Goals</td>
<td>Improve care coordination for patients to improve quality and reduce the cost of care by allowing providers to keep savings they generated through improved coordination.</td>
</tr>
<tr>
<td>Programmatic Health IT Requirements</td>
<td>At least 50% of participants must use CEHRT.</td>
</tr>
</tbody>
</table>
| Aligned HSX Services | • **Direct** messaging to close the referral loop and provide clinical information back to the referring provider; **Provider Directory** for patient attribution and referral ordering for more effective transitions of care, which can assist with the reduction of readmissions for ACO participants  
• **Encounter Notification Service** to support follow-up with patients after hospital visits and prevent readmissions |
| Additional Critical Success Factors | • Shared care plans among the care team for managing the patient  
• Cost of care information for patients  
• Patient risk stratification or risk score assignment for managing a panel  
• Eligibility and benefit information to ensure patients stay in network  
• Care gap alerts for each patient to ensure appropriate care is provided  
• Calculate quality measures both across the ACO and at the individual provider and practice level |
<table>
<thead>
<tr>
<th><strong>Episode Payment Models (Bundled Payments)</strong></th>
</tr>
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<tbody>
<tr>
<td><strong>Program Manager</strong></td>
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<tr>
<td><strong>Reach</strong></td>
</tr>
<tr>
<td><strong>Program Goals</strong></td>
</tr>
<tr>
<td><strong>Programmatic Health IT Requirements</strong></td>
</tr>
</tbody>
</table>
| **Aligned HSX Services**                     | • **Encounter Notification Service for Facilities** to help coordinate follow-up care between provider organizations  
• **Clinical Data Repository** access to pull supplemental clinical information about encounters |
| **Additional Critical Success Factors**       | • Shared care plans amongst the care team for managing the patient  
• Automatic assignment of encounters to a specific bundle along with the associated cost data for each encounter  
• Electronic eligibility and benefit information to ensure patients stay in network or within the bundle when referrals are ordered |
# Health Enterprise Zone (HEZ)

<table>
<thead>
<tr>
<th>Program Manager</th>
<th>PA DHS</th>
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<tbody>
<tr>
<td>Reach</td>
<td>North Philadelphia</td>
</tr>
<tr>
<td>Program Goals</td>
<td>Coordinate care for the Medicaid recipients in the HEZ to improve the quality of care, improve care outcomes, and decrease cost.</td>
</tr>
<tr>
<td>Programmatic Health IT Requirements</td>
<td>No codified requirements at this time but all participants are strongly encouraged to leverage all HSX services.</td>
</tr>
<tr>
<td><strong>Aligned HSX Services</strong></td>
<td></td>
</tr>
<tr>
<td>• Direct messaging to close the referral loop and provide clinical information back to the next provider of care; Provider directory for patient attribution and referral ordering for more effective transitions of care</td>
<td></td>
</tr>
<tr>
<td>• Encounter Notification Service to enhance follow-up care and outreach patients receive post-hospitalization and after emergency department visits</td>
<td></td>
</tr>
<tr>
<td>• Clinical Activity History to receive information about the patient at the point of care in a physician practice or emergency department</td>
<td></td>
</tr>
<tr>
<td><strong>Additional Critical Success Factors</strong></td>
<td></td>
</tr>
<tr>
<td>• Use of a population health management tool capable of exchanging care plans and interoperable with all EHRs used by the participants</td>
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</tbody>
</table>
HSX Service Enhancements Maintain Focus on Value-Based Care

Currently, HSX is well positioned to assist providers, systems, and payers across its widening service area. In pursuing the aforementioned programs, a well-designed and inclusive HIE is a rigorous tool for achieving the goals of trust, coordination, interoperability and data mobility across a large geography. This is where HSX plays an instrumental role in supporting its membership and coordinating priorities across the region through its various service offerings. HSX provides the technical and legal structure and support needed to achieve this coordination, as well as the financial stability of a member-driven approach. HSX also has an experienced engagement and adoption team working directly with members. The below represents areas where HSX is focused on enhancing its current suite of services to facilitate enhanced HIE across its trusted community.

A well-designed and inclusive HIE is a rigorous tool for achieving the goals of trust, coordination, interoperability and data mobility across a large geography.
**Smart Encounter Notifications & Intelligent Routing of Clinical Information**

As ENS goes into its third year of deployment and adoption across the HIO’s member community, HSX sees opportunity to enhance and tailor the way notifications and more robust clinical data are delivered to subscribing providers and organizations. HSX is working with key stakeholders to determine how various types of care providers (e.g. specialists, emergency physicians) can be more effectively notified about patients with certain conditions, patients who receive new medication orders and about patients who present to emergency departments who could be potentially considered a readmission.

Furthermore, HSX understands the emphasis its membership currently has on preventing readmissions. Recent literature has shown that “access to patient information is critical to reducing readmissions” and that “in study of emergency physicians’ perspectives of HIE conducted in New York City, the majority of respondents (63%) answered that their patients would benefit from information provided by HIE [with one study demonstrating] data extracted from HIE can enhance predictive modeling and create alerts for patients at high risk of readmission.”22

Finally, HSX is looking for opportunities to better integrate notifications and other clinical documents into EHR workflows and population health management tools to support the investments its members have made to ensure timely and increased adoption. HSX anticipates being able to offer more intelligent routing and delivery of notifications by year-end 2017. This timeline aligns well with the deployment of new payment and value-based care models in that the quicker and more accurately HSX can help its members to know critical encounter and clinical information about their patients, the more successful they will be in meeting the objectives of these programs.

**Population Health Reporting**

Currently HSX is also focused on developing a more formal offering around population health reporting to, in part, support the reporting requirements of the APMs and value-based care incentive programs with which its members participate. The development and approval of a use case on this subject is underway. Soon, HSX plans to develop a library of reports it can offer and regularly produce for its membership.

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Quality and Performance Measurement
Medical practice offices, hospitals, and health systems spend significant resources on quality and performance and yet continue to underscore the challenges they face in measuring these areas. Such measurement localized to an organization overlooks the way that care continues to push beyond the walls of a traditional hospital or ambulatory setting. Data from other community providers on attributed patients is often missing from these efforts. HSX, as a community convener, will be able to close these gaps in quality and performance measurement by aggregating and calculating the data needed for various contracts and quality-focused programs, such as CPC+.

Conclusion
Connectivity of electronic health information and interoperability of health information technology is a critical priority nationally supporting the goals of the Triple Aim. As ever-evolving methods of reimbursement become the “new normal” for providers within the broader HSX community, it will become increasingly important for these organizations to fully understand the applicable programmatic and IT requirements. Excelling in any of the programs described in this paper requires a health IT strategy and products that can support the increased levels of care coordination and focus on quality measurement that the programs necessitate.

HSX is well positioned to meet the current and future clinical data exchange and management needs for its members, as the HIE services that are offered today can be leveraged to be better informed about care patients receive from a variety of sources. HSX’s ability to notify providers about patient encounters in a timely fashion, its ever-growing clinical data repository that can be tapped to reconcile longitudinal patient information and Direct/Provider Directory services that facilitate the necessary point to point communication needed to improve care coordination can have a positive impact on the health of populations, how patients experience healthcare received, and, ultimately on how healthcare costs can be controlled.
**Exhibit A:**
**Direct Secure Messaging (Direct) / Provider Directory**

This diagram shows how discharge information is delivered from Hospitals/Emergency Departments to downstream primary care providers (PCP) using Direct Secure Messaging and leveraging the HSX Provider Directory.

**Exhibit B:**
**Automated Care Team Finder Service (ACTF)**

This diagram shows how discharge information is delivered from Hospitals/Emergency Departments to downstream primary care providers (PCP) using Direct Secure Messaging and leveraging Payer PCP attribution and the HSX Provider Directory.
Exhibit C:
Clinical Activity History (CAH)

This diagram shows how a CAH document containing clinical history, according to payer claim, can be provided back to a requesting provider at the point of care (e.g. Emergency Department)
Exhibit D:
Encounter Notification Service (ENS)

This diagram shows how a patient is subscribed for and then how the subscribing PCP or Care Team is notified about admissions and discharges from HSX participating hospitals/health systems/skilled nursing facilities.
Exhibit E:  
Encounter Notification Service (ENS) for Facilities

HSX Member  
Hospital/Health  
System/Skilled  
Nursing Facility

List of Admits

Subscribing Facility  
Receives List of  
Admits for Previously  
Discharged Patients

ADT/  
Patient Subscription for designated  
timeframe (e.g. 30 days, 90 days)

This diagram shows how a patient is subscribed for automatically by a hospital/health system or skilled nursing facility and then how that same organization is notified about admissions that happen at HSX participating hospitals/health systems/skilled nursing facilities within the defined subscription period (e.g. 30 days, 90 days).