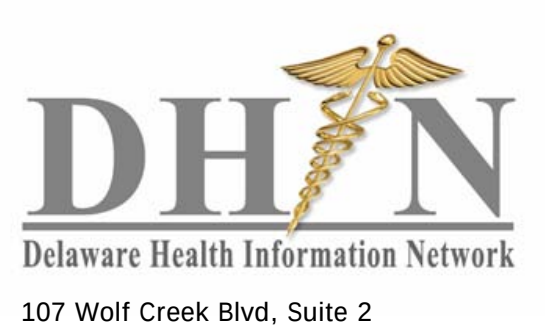


107 Wolf Creek Blvd, Suite 2
Dover, Delaware 19901

Business Plan

Service Area Specific Plan for Data Exchange and NHIN Participation and Sustainability

November 14, 2008

Introduction

In April 2007, Delaware became the first state to implement a health information exchange to connect health care providers (hospitals, laboratories, and physician practices) statewide. The Delaware Health Information Network (DHIN) originated as a vision of the Delaware General Assembly, which established the instrumentality in 1997. A public–private partnership, DHIN was given the mission of developing an electronic data interchange network to provide health care professionals across the state with immediate access to the most current patient information.

Where political and logistical barriers previously existed, DHIN has succeeded in crossing geographical and organizational boundaries to expedite the availability of clinical test results to ordering physicians. Under the regulation of the Commission, DHIN contracted with technology firms Medicity and Perot Systems to implement and maintain the technological infrastructure needed to ensure more timely delivery of laboratory results, imaging studies, and admission face sheets.

The transparent availability of information, and the incentives and ability to use it, are critical prerequisites for effective, safe, coordinated care. According to a Commonwealth Fund report, U.S. health spending is projected to increase from 16% of GDP in 2006 to 20% in 2016—from $2 trillion to $4 trillion.[1] Despite this enormous expenditure, care is either underused (patients do not get recommended care) or overused (patients receive inappropriate care that is of little value or may expose them to harm). Furthermore, missing information has been shown to adversely affect care in 44% of clinic visits and delay care in 59% of visits.[2] In 2007, Kaelber and Bates reported that 18% of patient safety errors and 70% of adverse drug events could be potentially eliminated if the right information about the right patient was consistently available at the right time.[3] Nationwide use of a system that incorporates many of the features already in place in DHIN could improve patient safety and clinical outcomes while saving more than $80 billion over 10 years.[1] These savings could be attributed to fewer duplicate tests, shorter hospital stays, and reduced administrative costs.

DHIN was selected as one of nine health information exchanges to participate in the National Health Information Network Trial Implementation project led by the Office of the National Coordinator for Health Information Technology. As such, DHIN is helping to shape the infrastructure and standards for a nationwide health information exchange.

Goals:

DHIN abides by five primary goals which serve as the basis for interoperability among all health care providers in the State of Delaware:

1. To improve the care received by patients served by Delaware's health care system and to reduce medical errors associated with the inaccurate and incomplete information available to providers of medical care.

2. To reduce the time and financial costs of exchanging health information among health care providers and payers (necessary for patient care), by reducing the complexity of the current distribution methods and drastically increasing use of electronic means.
3. To improve communication among healthcare providers and their patients to provide the right care at the right time based on the best available information.
4. To reduce the number of duplicative tests and to afford specialists a better understanding of the patient upon referral from his/her primary physician.
5. To improve the efficiency and value of electronic health records (EHR) in the physician office and to assist those physicians without an EHR to better organize and retrieve test results.

DHIN Governance:

The Delaware Health Information Network (DHIN) was created through Delaware legislation in 1997 to"…promote the design, implementation, operation and maintenance of facilities for public and private use of health care information in the state..." DHIN's original enabling legislation (Delaware Code Title 16, Part XI, Chapter 99, Subchapter 9922) details the Powers and Duties of this public-private partnership:

"Develop a community-based health information network to facilitate communication of patient clinical and financial information, designed to:

1. Promote more efficient and effective communication among multiple health care providers, including, but not limited to, hospitals, physicians, payers, employers, pharmacies, laboratories and other health care entities;
2. Create efficiencies in health care by eliminating redundancy in data capture and storage and reducing administrative, billing and data collection costs;
3. Create the ability to monitor community health status; and
4. Provide reliable information to health care consumers and purchasers regarding the quality and cost effectiveness of health care, health plans and health care providers…"

Since the DHIN's original charge was written over a decade ago, its board has engaged in several studies and pilot projects directed at fulfilling its mission. As a result of these efforts, DHIN, through the partnership developed by its members, holds the distinction of becoming the first statewide clinical health information exchange.

The Public-Private Board of Directors is comprised of diverse organizations all representing the primary stakeholders of health information exchange. They include representatives from the following constituency groups, organizations and agencies:

- Consumers
- Delaware Healthcare Association (representing hospitals) and the Medical Society of Delaware (representing physicians)
- Payors, including Blue Cross Blue Shield of Delaware and Delaware Physicians Care, Inc., a wholly owned subsidiary of Aetna, and Medicaid.
- Delaware State government agencies: Delaware Health Care Commission, Department of Insurance, Department of Technology and Information, Division of Public Health, Office of Management and Budget

- Delaware State Chamber of Commerce, large employers and the University of Delaware

An executive director oversees the day-to-day operations of the project with support from staff and guidance from the DHIN Executive Committee as well as advisory committees and ad-hoc workgroups who steer the project and ensure input and buy-in from all stakeholder groups. These committees and workgroups include:

- Clinical Advisory Committee
- Consumer Advisory Committee
- Evaluation Committee
- HIMS Committee
- Project Management Committee
- Continuum of Care Workgroup
- Emergency Access Workgroup
- Financing and Sustainability Workgroup
- Lab Standardization Workgroup

Critical Success Factors

Coordinated, collective action is required at every level of the health care system to realize the full benefit of health information exchange. Collaboration is essential to ensuring interoperability across providers of care. DHIN has achieved a significant and growing level of interoperability because it is flexible enough to work with the existing systems and infrastructure at the participating organizations. DHIN is capable of connecting with virtually any system or technology solution able to transmit Health Level 7 (HL7) transactions—the internationally accepted standard for health care data sharing. This architecture ensures wide adoption of the system by organizations that perform tests and services in support of clinical care. The success of DHIN is dependent on cooperation and consensus-building across all participating organizations. By bringing everyone to the table (health care professionals from competing hospitals, laboratory personnel, technology specialists, consumers, and state officials), the network has been able to reach meaningful compromises to work toward building a system that meets the greatest needs of all end-users.

In 2004, DHIN further demonstrated its commitment to its users through creation of a Consumer Advisory Committee. Created to provide greater opportunity for patient engagement and input into enhancement of the network, this committee guides policies with respect to privacy, functionality, and education. Members of the committee include community health center patients; persons with disabilities; family caretakers; and representatives from AARP, Mental Health Association, National Association for Mental Illness in Delaware, and faith-based communities.

Functionality

Traditionally, physicians receive laboratory results and radiology reports by fax, mail, courier, and interoffice mail. Such protocols are often slow and introduce numerous opportunities for data to be lost or misdirected. In many cases, physicians receive reports from at least five different laboratories, each of which uses a different format and delivery method. DHIN's

approach allows for expedited access to information while decreasing the likelihood for error. By providing all clinical reports and results in one standard format regardless of where the test was performed, DHIN eliminates opportunity for misinterpretation of data. The ordering provider knows who performed the test by the logo and contact information presented on the report.

Analogous to a post office or an automated teller machine (ATM) network, DHIN forms a clinical clearinghouse for real-time laboratory data and radiology reports that can be used by all participating hospitals, office practices, and independent laboratories. The network connects Delaware's largest cities with outlying rural and coastal areas through the participating organizations of Bayhealth Medical Center (Dover and Milford), Beebe Medical Center (Lewes), Christiana Care Health System (Wilmington, Newark), and Laboratory Corporation of America (LabCorp; statewide). DHIN is currently developing interfaces with Doctors Pathology Services, St. Francis Hospital, Quest Diagnostics—these new data senders are expected to go live in early 2009. Nanticoke Hospital is expected to go-live later in 2009. In total, DHIN delivers data to over 492 physicians at 84 primary care and specialty practices and all four of the State's Federally Qualified Health Centers.

Instead of each practice having to build its user interface independently, DHIN has created standard interfaces that are customized to the job function of the end-user. Through these interfaces, health care and administrative personnel can access patient identification and demographic data (admission face sheets), payer information, admission discharge and transfer (ADT) data, laboratory and pathology results, radiology reports, and public health biosurveillance data (reportable diseases and emergency chief compliant). During DHIN's first month of live operation, 800,000 reports were exchanged through the network; now, approximately 1.7 million transactions are distributed through DHIN monthly, representing 81% of Delaware's hospital admissions and 85% of outpatient laboratory tests. Once the new data senders are live, it is expected that these percentages will reach the 90% mark.

Users can access clinical results in three ways: electronic inbox, direct interface to an existing electronic health record (EHR) system, and AutoPrint. The electronic inbox provides a secure mailbox for delivering reports to ordering physicians and anyone copied on the order. Information is accessible in the inbox for 30 days and may be saved, printed, or transferred to another physician for consultation purposes. Reports stored in the inbox can be sorted by patient, result type, out-of-range alert or performing facility. The AutoPrint option sends results directly to a network printer on the basis of the practice's printing preferences. Physician practices that choose to receive data via an existing EHR system are set up to connect through their EMR vendor, whereby a clinical result can be automatically matched with a patient record and presented to the physician in his or her EHR worklist.

In 2009, DHIN also will offer transcribed reports delivery, query capabilities of all results and reports delivered through the system, electronic laboratory order capabilities, image delivery, and bidirectional exchange with EHRs for lab order entry. Equally important, the network will be empowering patients by introducing a portal that will enable consumers to access health records at home. As an added benefit, patients will be able to complete a standardized data form at home instead of filling out paperwork on clipboards in the waiting room—which also reduces

administrative costs spent on manual data entry. Future enhancements will allow patients to access their medication history, receive alerts, and review their own health records.

The following schedule is provided to illustrate the roll-out of future functions, which will contribute to DHIN's sustainability due to their added value to DHIN users:

Implementation Year	Functionality
Year 0 **2006 - 2007** **Completed**	Data Transport Security & Access Controls Audit Processing and Reporting Secure Results/Reports Delivery Laboratory Results Pathology Results Radiology Reports Admission, Discharge, Transfers Patient Demographics/Face Sheets Inbox Management Printing & Faxing Sorting Results Retrieval & Reprinting Results Forwarding Interfaces to EHR Systems
Implementation Year	**New Functionality**
Year 1 **2007 - 2008** **Completed**	Secure Results/Reports Delivery Patient Inquiry MPI Harmonization Record Locator Service Interfaces to EHR Systems Public Health Reporting
Implementation Year	**New Functionality**
Year 2 **2008 -2009** **In Progress**	Inquiry Viewing of Patient-Centric Data Patient Identification Results Inquiry Other Clinical Documents Inquiry Medication History Lab Order Entry from EHR Radiology Images EHR Primer ePrescribing eOrder Entry from DHIN Data Storage P4P Analytics Electronic Signature Interfaces to EHR Systems Enhanced Public Health Reporting
Implementation Year	**New Functionality**
Years 3 -5 **2009 - 2012** **Planned**	Continuity of Care Document Patient Portal Administrative functions via DHIN Enhanced Public Health Reporting

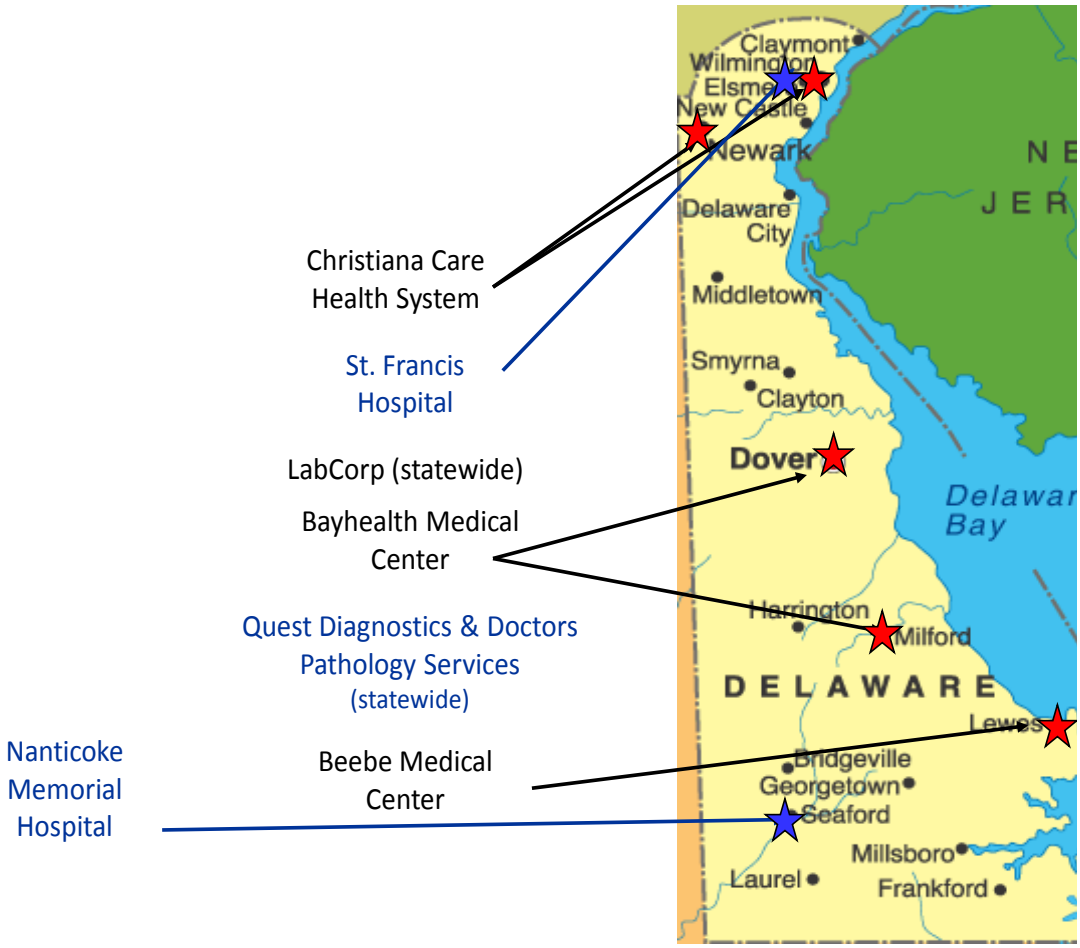
	Interfaces to EHR Systems Research Data Warehouse (de-identified)

Data Sharing at Nationwide Level

DHIN will be implementing patient record search capabilities in March 2009. With this functionality, DHIN will have fully implemented the infrastructure necessary to support the National Health Information Network (NHIN) core service functionality of: subject discovery, query and retrieval of records from other health information exchanges, including the NHIN Summary Record. In early 2010, DHIN will be implementing the capability to present a summary record for display within a querying physician's EHR.

Service Area

The following map depicts the current service area of the DHIN. While DHIN is focused on connecting all healthcare providers within the State of Delaware, there is a great deal of interest in moving beyond State boundaries. Within the next two years, DHIN will begin to seek connectivity with healthcare providers in Delaware's healthcare service area, including Baltimore, Salisbury and Elkton in Maryland and Philadelphia in Pennsylvania. This effort may be through the NHIN or via direct connections to the primary hospitals and labs in this area and enrollment of community physicians.



Marketing

During the first two years of operation (May 2007 to May 2008) DHIN has focused on building the data available through the system and the functionality to support physician users (secure results delivery and patient record inquiry). Enrollment into the DHIN has been through word of mouth and presentations made to audiences of physicians and their office staffs. Through these efforts, DHIN has enrolled nearly 28% of practicing physicians in the State.

In early 2009, DHIN will implement a version upgrade of the system to include added flexibility for results delivery options as well as the patient record inquiry function to include clinical results and medication history. Upon completion of the conversion of all current users from the old version of DHIN to the upgraded version, DHIN will undertake a broad marketing effort to all physician practices in the State.

This marketing effort will include multiple methodologies:

- Visits made to physician practices
- Follow up on referrals received from DHIN participating practices
- Exhibits and presentations at medical/user focused conferences, seminars and events
- Guest articles in clinical/medical publications/newsletters/journals
- Promotional items that keep the DHIN name in the medical-public domain
- Educational/Trainings of the provider relations, sales and physician outreach staff at health plans, reference labs and hospitals.

In addition, DHIN will collaborate with participating hospitals, labs, health plans and public health agencies to promote the use of DHIN and provide incentives for enrollment.

Communication to consumers also is important. DHIN is currently working with a marketing firm and its consumer advisory committee to develop consumer-directed communications regarding DHIN participation and benefits.

Benefits of DHIN

DHIN provides benefits to all stakeholders – consumers, hospitals, labs, clinicians and health plans. The following is an outline of these benefits.

Saves Time

- Results and Reports Immediately
- Clearly indicated out of range/critical results alerts
- All results in one place, in one format
- Sorting by patient, alert, performing facility, etc.
- Secure forwarding of results for consultation

Improves Quality of Care

- Reduces incidence of duplicate orders and missing results
- More complete information in Emergency Dept.
- Less chance of error
- Connectivity to Personal Health Record
- Continuity of information in event of a disaster

Reduces Cost

- Administrative Savings – all results in standard format from a single system
- Cleaner Claims Submission
- Public Health Reporting and Management
- Improved Case Management
- Fewer co-pays from Duplicate Services

Enhances Privacy

- State of the art security controls
- Redundant access Controls
- Audit Reporting

Funding and Sustainability

Capital Phase

Currently, DHIN is funded but a combination of Federal, State and Private funds. These funds ensure diversity in the funding streams for the DHIN as follows;

Federal Contracts:
DHIN's contract with the Office of the National Coordinator provides funding for DHIN to build functions consistent with the NHIN Trial Implementations core services as well as the laboratory harmonization and biosurveillance use cases. In addition to this contract, DHIN has a contract with the Agency for Healthcare Research and Quality for $4.7 million. This contract is in its third year of five years.

State Funding:
DHIN has received a total of $6.5 million dollars from the State's capital budget over the past three years. This funding is contingent upon dollar for dollar matching funds from the private sector.

Private Funding:
DHINs model for private sector funding during the start-up or capital phase of the project (FY07 to FY10) is based on the premise that those who benefit from DHIN shall share in its financing. DHIN is currently a secure results delivery system with the benefits going primarily to hospital and lab participants. These participants, or data senders, pay a proportionate share of the cost based on their transaction volume as well as their own start up costs associated with hardware and interface development.

Ongoing Operations

DHIN is currently in planning stages for its long-term sustainability model. As DHIN moves from a results delivery system (or push model) to a patient record inquiry system (or pull model), the beneficiaries of the system will grow to include payers of health care. DHIN is currently in negotiations with the major health plans covering Delaware to define a payment structure that will include health plans as well as large, self-insured employers. The model is based on a per member per month fee structure that will change as the benefits to the payer increase. By

bringing in a more diverse membership and fee structure, the cost to the data senders will decrease; thus leveling the investment across multiple healthcare sectors.

DHIN also is working with the State of Delaware to change the financing from the State's capital budget to its operating budget by showing cost savings and reallocation derived from a more efficient way of doing business for many of their divisions and departments, including: public health, Medicaid, employee benefits, correctional health, and substance abuse and mental health.

Additionally, DHIN will be implementing over the next year, added value services for physician offices and consumers. These services will have a nominal fee associated with those who choose to participate as follows:

Physicians:

DHIN will be implementing an EHR Primer add on to the DHIN clinical inbox. The Primer will offer those not yet ready to purchase an EHR with capabilities to support: ePrescribing, eOrder entry, persistent data storage, eSignature, pay for performance analytics and eReferrals and consults. This suite of services will be offered at a monthly subscription fee per physician user.

Consumers:

DHIN is considering several options with respect to patient participation and in accordance with the consumer access use case; including the ability to query on one's own records and direct that information to a personal health record (PHR). DHIN will remain vendor neutral and will support the patient's choice of PHR. Additionally, services that help to minimize paperwork in the practice office and hospital as well as improve patient flow at various healthcare settings also are being considered.

References

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