WHITE PAPER

A SPECIAL REPORT FROM THOMSON REUTERS AND eHEALTH INITIATIVE: DETERMINING THE PATH TO HIE SUSTAINABILITY

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INTRODUCTION

For years, health information exchange (HIE) initiatives have been searching for the elusive answer to long-term sustainability. With the development of the State Cooperative Agreement program and the advent of state-run HIEs, a new crop of organizations are attempting to determine a long-term sustainability plan that will enable their organizations to succeed and flourish for years to come. However, determining how to be sustainable has proved difficult in the past and promises to be more complicated in the current and future HIE landscape. It is vitally important that organizations understand what it means to be sustainable, the costs involved in supporting not only the organization but also the core and value-add services, and the revenue streams that will be the most viable options for sustainability now and in the future.

In the context of this paper, the definition of sustainability from the National Opinion Research Center (NORC) at the University of Chicago Health Information Exchange Economic Sustainability Panel[1] is most appropriate. Sustainability is likely to exist in an environment where:

- It is feasible for any healthcare provider, healthcare consumer, or payer to electronically share individually identifiable data to support efficiency and quality of care in a standards-based format using nonproprietary mechanisms and in a manner compliant with all state and federal security and privacy laws, rules, and policies; and
- The costs and benefits of the HIE are aligned such that, once established, the HIE will be funded through mechanisms that reflect the advantages that are accrued from HIE (e.g., third-party reimbursements and fees for specific transactions) rather than through extraordinary sources (e.g., ongoing government subsidies).

This paper will examine HIE sustainability issues. In particular, it will examine the various costs HIEs must consider from startup to ongoing maintenance, the revenue streams that can provide for these costs, and factors for HIEs to consider in the development of a sustainability plan.

COSTS

For community and state-run HIEs to be sustainable, they must generate enough revenue to cover all of their costs. It is therefore incredibly important that these HIEs understand the costs involved in starting and maintaining an HIE.

Startup and Implementation Costs

Two of the largest costs that HIEs must consider are startup and implementation costs. Large capital investments are needed to create the infrastructure necessary for an HIE to function. Many HIEs receive grant funding for their startup costs from government agencies, foundations, philanthropists, or seed money from key stakeholders. Other HIEs take loans for the initial investment funds and incur costs for repayment of the loan funds, as well as the interest accrued on the loans.

In addition to the large capital investments needed, the general and administrative costs associated with implementing a new HIE have to be taken into account. Many HIEs need additional staff to meet tight timeframes required by the State HIE Cooperative Agreement and to show a return on investment to stakeholders. In many cases, consulting groups are retained to bring expertise that the HIE staff does not have. Furthermore, HIEs use consultants to assist in architectural design, data center development, and creation of the legal frameworks required by the Health Insurance Portability and Accountability Act (HIPAA) and in accordance with state laws and regulations. The state-run HIEs also have the additional consulting expense of creating the state strategic and operational plans that are required to be submitted to the Office of the National Coordinator (ONC) under the State HIE Cooperative Agreement program.

Hosting Services and Data Service Costs

Many community and state-run HIEs include centralized technology and/or databases. As a result, most HIEs will incur costs for hosting services and data services, even if a third party is providing the hosting services. There are ongoing maintenance and upgrade costs, as well as the potential need for back-up systems and hot sites, which are off-site locations where services can be relocated in the event of a disaster.

Administrative and Operational Costs

While the startup and implementation costs are large, the ongoing administrative and operational costs can be a much larger burden on HIEs. Administrative costs include: leases, full-time employees, consultants, and marketing. Operational costs include licensing and maintenance fees, hardware and software upgrades, insurance/liability fees, and legal fees. The startup and implementation costs, administrative and operational costs, and the potential hosting services and data center costs can run into the millions.

The following table provides an example of the ranges of costs that could be incurred in developing an HIE based on a configurable "off the shelf" implementation.

FIGURE 1: Typical Costs for Off-the-Shelf HIE

TYPE OF HIE COST	RATIO OF COMPONENT COSTS COMPARED TO OVERALL COST*
Startup and Implementation Costs	15-25%
Hosting Services and Data Center Costs	25-35%
Administrative and Operational Costs	45-55%

*Based on Thomson Reuters market experience

In addition to these costs, HIEs must also generate enough revenue to support core and value-add services. In most HIEs, each customer is required to pay for core services, while the purchase of value-add HIE services is at the customer's discretion.

FIGURE 2: Core and Value-Add HIE Services

CORE SERVICES	VALUE-ADD (OPTIONAL) SERVICES
Master Patient Index	Medication Reconciliation
Master Provider Index	Certified Physician Order Entry
Record Locator Services	EMR-Lite
Clinical Messaging	ePrescribing
Clinical Data Routing	Care Coordination Modules
Longitudinal Patient Record Viewer	Administrative Services
HIE to HIE Interoperability	Patient Management Tools
HIE-Related Meaningful Use Support	Quality Reporting

Considering the high costs of operation, HIEs must evaluate the various revenue streams that will sustain their organization now and in the future. The decisions HIEs make now will affect their sustainability for years to come. Additionally, the federally funded state-run HIEs are required to submit a financial sustainability plan to ONC by 2012. Therefore, the next year will be a critical time for many HIEs to develop their plan. It is important to review and evaluate the revenue streams that community and state-run HIEs have considered and employed.

REVENUE STREAMS

Grants — Public

A major source of funding, especially for startup and implementation, is public grants. The Health Information Technology for Economic and Clinical Health (HITECH) Act provided for billions of dollars in funding for state and community HIEs. In addition, the Centers for Medicare and Medicaid Services (CMS) have provided additional funding to states to support the adoption of health IT and HIE. In the past, the Agency for Health Research and Quality (AHRQ) and Health Services and Research Agency (HRSA) provided grants to community HIEs. Public grant funds are proving to be pivotal in helping HIEs get up and running. However, as the funds diminish, community and state-run HIEs will need to determine how to be independently sustainable. Below are the major public grants currently available to HIEs, their eligibility requirements, and expiration dates.

State Health Information Exchange Cooperative Agreement Program[2]

- Funds totaling $547,703,438.
- The District of Columbia, 50 states, and five territories received awards.
- Matching requirements for the states are as follows:
  - FY2010 — October 1, 2009–September 30, 2010
    There is no match requirement.
  - FY2011 — October 1, 2010–September 30, 2011
    One match dollar is required for every 10 federal dollars. Divide the amount budgeted for the above time period by 10 to obtain the required amount of match for FY2011.
  - FY2012 — October 1, 2011–September 30, 2012
    One match dollar is required for every seven federal dollars. Divide the amount budgeted for the above time period by seven to obtain the required amount of match for FY2012.
  - FY2013 — October 1, 2012–September 30, 2013
    One match dollar is required for every three federal dollars. Divide the amount budgeted for the above time period by three to obtain the required amount of match for FY2013.
- Program expires FY2014

Challenge Program[3]

- Funds totaling $16,296,562.
- Offers 10 potential awards to participants in the State HIE Cooperative Agreement program.
- Award encourages breakthrough progress for nationwide health information exchange in five challenge areas. The identified challenge areas were established by federal and state governments, since the implementation of the HITECH Act.
- The project period coincides with the State HIE Cooperative Agreement project period.

Beacon Community Program[4]
- Funds totaling $233,907,442.
- Currently 17 awards with the potential for additional awards.
- The awards are to support specific and measurable improvement goals in the three vital areas for health systems improvement: quality, cost-efficiency, and population health; and to demonstrate the ability of health IT to transform local healthcare systems.
- Currently five of the Beacon Communities are focusing on implementing, increasing, or improving HIE.
- The project period is 36 months.

Strategic Health IT Advanced Research Projects (SHARP) Program[5]
- Funds totaling over $15 million.
- One award related to HIE to Harvard University for Healthcare Application and Network Platform Architectures.
- The project period is four years.

CMS Medicaid Transformation Grants: Health Information Technology
- Funds totaling $150 million have been issued.
- Funds can be used for electronic health records, e-prescribing, clinical decision support, and health information exchange.
- The District of Columbia, 35 states, and one territory were awarded grants in 2007.

Medicaid EHR Incentive Program Funds[6]
- Provides 90 percent administrative matching funds to State Medicaid Agencies.
- States applying for the 90 percent matching funds must meet stringent criteria including nonduplication of work under a separate federal grant such as the State HIE Cooperative Agreement.

Grants — Private

Community and state-run HIEs often seek private funding for startup and implementation costs. The 2010 eHealth Initiative Annual Survey on HIE identified some of the most common sources of private funding, which include: hospitals, payers, physician practices, and philanthropic sources. Employers are also beginning to invest in exchanges.

- **Hospitals**: With pending Meaningful Use requirements, easy access to physician networks, and efficiency demands, many hospitals realize investment in health information exchange is critical to their future. Hospitals are the most common source of startup funds for exchanges.
- **Payers**: Many payers have been shown the value of investing in a community or state-run HIE. By investing in an HIE, rather than building HIEs themselves or relying on multiple hospital systems to build HIEs, they realize a large financial return on investment. Consequently, many payers have provided grants for capital expenditures to assist HIEs in implementation.
- **Physician Practices**: Similar to hospitals and payers, many physician practices are beginning to recognize the value of investing in exchanges to improve quality and efficiencies as well as meet upcoming requirements for Meaningful Use.
- **Philanthropic Sources**: There are numerous nonprofit organizations that exist to improve healthcare quality, access, and efficiency. These organizations can be a valuable funding source for HIEs.
- **Employers**: Employers also receive a financial benefit from involvement in an HIE. The benefit is the potential for lowering insurance costs and improving employee health and attendance. These potential cost savings are beginning to encourage employers to partner with community and statewide HIEs.

Usage Fee Model

There are two major types of usage fees that community and state-run HIEs are utilizing: subscription and transaction fees.

Subscription

Subscription fees can be charged to the data providers and users of an HIE. The subscription fees are a set amount that can be monthly, annual, or by type of service. The fees will typically vary by the size of an organization or be a tiered structure based on the number of services used. Subscription fees allow data providers and users to purchase a set level of access.

Subscription fee models are often based on a monthly or annual set fee. This allows HIEs to lower the overall cost of participation and therefore assist HIEs with long-term planning. HIEs, in turn, will have more data providers and users participating in the HIE, thereby increasing revenue. In addition, the HIE's administrative costs will be lower, since they will not have to monitor and track individual transactions of any organization.

Transaction

Transaction or "by the drink" fee structures charge data providers and users for each transaction that occurs in the exchange. Transaction fee arrangements may include fees for sending and/or receiving secure messages, lab results, claims, eligibility transactions, and others.

There are a number of challenges in the transaction fee structure. The fees paid to the HIE are not always predictable, they vary based on usage. For large organizations, transactions can run into the millions/day, causing a potentially unreasonable expense for data providers and users. This may adversely affect usage of the HIE. Finally, transaction fees are a fluctuating revenue source for HIEs — one month may yield a high number of transactions and revenue, while the next month yields very little.

An important factor in sustainability is a steady revenue stream. The transaction fee structure may not provide HIEs needed stability. HIEs also must consider the high administrative overhead needed to monitor and record all transactions and assess fees. This will diminish the revenue generated from the transaction fees. A benefit of the transaction fee structure is the potential for large revenue if the participation hurdle can be overcome. However, it is not yet clear whether organizations will participate en masse in an HIE with a transaction fee structure.

Utility Model/Levies

Since HIE is a public good, similar to other public utilities, many states are considering utilizing taxes to support HIEs. Many states are beginning to explore this model because health information exchange provides such a significant "shared" benefit, since all the stakeholders benefit from the exchange. Usually, state legislation is required to levy a new tax. State governments may use various methods of taxation including: revenue based, per member/per month, transaction fees, or part of a provider or hospital's state licensure fee. For example, North Carolina is proposing a tax on provider, hospital, and insurance licenses. However, given the current economic and political environment, it may be difficult to enact legislation levying new taxes on businesses or individuals.

Shared Revenue Model or Brokerage Fee Model

A relatively new revenue source for community HIEs that is very common in the wireless device arena is the shared revenue or brokerage fee model. The HIE allows a third party to offer services to the HIE network; in return, the HIE receives a share of the revenue generated. This type of arrangement is very similar to the wireless marketplace, where applications are available to everyone on the network. In the HIE space, the HIE would serve as a marketplace for third parties to offer unique modules or applications (e.g., ePrescribing) to all the HIE users. While this model has the potential to generate revenue, it may require more flexible data use agreements.

Clinical Services

Community and state-run HIEs may offer a number of clinical services. Sometimes these services are included as core services as part of a subscription or transaction fee model. In other cases clinical services may also be value-add services. HIEs should be flexible enough to adjust their core services to ever-expanding market expectations regarding core service options. Some examples of clinical services include:

- **Secure messaging** — Facilitates the transfer of patient information between different stakeholders, such as providers and hospitals, thereby reducing cost and increasing quality of care.
- **ePrescribing** — Allows providers and hospitals to submit prescription requests electronically, reducing errors and increasing efficiency. In addition, some ePrescribing systems report on fill rates, enabling providers to better manage patient care.

- **Electronic Health Record (EHR)-Lite** — Some community and state-run HIEs are offering an EHR-Lite option for providers who do not have an EHR system. The EHR-Lite is typically cloud based (hosted on the HIE's servers rather than installed in a provider's office), which reduces the cost of implementation and ongoing maintenance and upgrades for providers. It also allows the state-run HIEs to meet the ONC requirement that they support all providers in achieving Meaningful Use.
- **Laboratory and radiology results delivery** — The electronic delivery of lab and radiology results increases efficiency for providers and hospitals and the quality of care for patients. It also decreases the cost associated with faxing or mailing results and potential medical errors.
- **Picture Archiving and Communication System (PACS) Reporting** — Enables the management and distribution of medical images captured by multiple modalities (X-ray, CT, MRI, PET, and others). PACS Reporting has the potential to decrease the costs associated with medical errors and the current costs of sending images between providers and hospitals. In addition, it can reduce the costs associated with duplicative testing by providing physicians access to prior images captured in another location.

Administrative Services

Administrative services are a revenue stream being considered by many community HIEs and a large number of state-run HIEs. This revenue stream may be attractive for the state-run HIEs that have the ability to connect with their state Medicaid Management Information System (MMIS). Administrative services being offered to providers and hospitals include the following:

- **Claims processing** — Allows providers and hospitals to submit claims electronically through a centralized mechanism. This service eliminates multiple claims submissions through different payer systems as well as paper claims.
- **Eligibility verification including universal eligibility** — Allows providers and hospitals to verify eligibility electronically, typically on one system rather than multiple systems or via fax or telephone.
- **Prior authorization** — Allows providers and hospitals to submit prior-authorization requests through a centralized mechanism. This service eliminates paper and fax submissions for prior authorization, decreases wait time, and streamlines the request process.

The three administrative services above are not only beneficial to providers and hospitals, but also to payers. When claims processing, eligibility verification, and prior-authorization services are performed through an HIE, payers may not incur the financial burden of supporting additional software and hardware systems to perform these functions.

Payer Value-add Services

The use of an HIE has the potential to lower licensing, maintenance, and operational fees that payers would incur if they supported these services themselves. Some HIEs are offering the following value-add services for healthcare payers:

- **NCQA/HEDIS reporting** — Allows payers to collect data through the HIE to support NCQA and HEDIS reporting requirements. Utilizing HIEs provides better data in a more timely fashion.
- **Wellness programs and care coordination support** — Payers can use wellness programs and care coordination support from HIEs to lower costs associated with claims payment. The HIE also allows payers to support increased care management by providing the care manager with a complete picture of the patient.
- **Patient education** — HIEs can provide patient education, potentially through a portal. Education materials can include videos, brochures, articles, and tutorials that will assist patients in managing their care. When patients manage their care effectively, costs are reduced. Payers can utilize an HIE to provide this patient education, eliminating the operating costs of providing the information themselves.
- **Treatment cost calculators** — Facilitates better management of the consumer's own healthcare by identifying the patient's costs associated with a specific treatment before care. Cost calculators allow payers to set consumer expectations and ultimately decrease unnecessary utilization.

Provider Value-Add Services

Community and state-run HIEs are providing value-add services specifically for providers. These services increase the sustainability proposition of the HIE by solving business problems of the provider members that purchase them, some of which extend ongoing support to the HIE. For example, according to Mark Bell, CIO of the North Carolina Hospital Association, "North Carolina hospitals and providers are coming together to leverage the benefits of a shared HIE platform to maximize operational and clinical value. Highlighting shared services such as patient inquiry, messaging, labs, e-Prescribing, CCD generation, clinical alerts, and public health reporting helps build the case for cost sharing among the participants of an exchange, minimizing the cost of sustainability. The shared HIE approach empowers robust models of care among diverse stakeholders, including the advanced medical home and Accountable Care Organization, which benefit patients and the healthcare delivery system as a whole."

As competition between HIEs increases, these value-add services will become increasingly important in enticing providers to join an HIE.

- **Meaningful Use** — Providers need assistance in meeting Meaningful Use objectives and measures; especially as the health information exchange requirements increase. Providers look for an HIE that can meet the requirements now and in the future.
- **Quality Reporting** — Assists providers in participating in the CMS Physician Quality Reporting System (formerly PQRI) and hospitals in participating in the Hospital Quality Initiative program. This service can help providers record and report quality metrics to CMS, potentially increasing their incentive payment.
- **Continuity of Care Applications** — As the patient-centered medical home model grows, providers will be looking for ways to provide continuity of care to patients. HIEs that can offer applications that allow providers to handle transitions of care will likely benefit.

FIGURE 3: HIE Revenue Streams

	BENEFITS	CHALLENGES
Grants — Public	• Multiple grant options today • Significant dollars are currently available	• Matching fund requirements • Provide limited sustainability timeframes
Grants — Private	• Multiple grant options today • Significant dollars currently available	• Provide limited sustainability timeframes • May come with payer-specific "strings attached"
Usage Fees — Subscription	• Low administrative overhead • Predictable revenue stream	• Value-add services often required to achieve sustainability post grants
Usage Fees — Transaction	• Revenue generation based on activity can mirror variable costs	• Value-add services often required to achieve sustainability post grants • "By the drink" pricing may impede provider adoption • Fluctuating revenue source • Requires higher administrative support than most other revenue sources
Utility Model/Levies	• States can match revenue to stakeholders • Low collection default rates	• Unpopular in current economic and political environment • Administrative costs consume a portion of revenue
Shared Revenue Brokerage Model	• Recurring revenue requiring minimal support • Competitive offerings may drive	• Requires active partner management • May require more flexible data use agreements
Clinical	• Viewed as high value by providers • Support HIE's core value of clinical interoperability • May allow HIEs in competitive markets to differentiate	• May require adjustments to achieve the right mix between core and value-added • May overlap/compete with other EHR/HIT provider systems
Administrative Services	• May eliminate the burden on providers and payers to support separate administrative systems.	• May require nonclinical patient consent • May raise privacy concerns • Commodity pricing by existing players may make profitable price points difficult to achieve
Payer Value-Add Services	• Viewed as high value by payers	• May require nonclinical patient consent • May raise privacy concerns • May cause provider and patient participation concerns
Provider Value-Add Services	• May allow HIEs in competitive markets to differentiate	• May overlap/compete with other EHR/HIT provider systems

KEY CONSIDERATIONS

In planning for sustainability and selecting a model, there are a number of strategic questions that community and state-run HIEs should address periodically to ensure the model's continued viability. A few key questions to consider are provided below.

- What sources of public and private funding are available?
- What type of architectural solution will the HIE implement?
- Will the HIE use the system integration structure or a configurable off-the-shelf model?
- What are the operational costs of the HIE during the implementation phase versus ongoing maintenance?
- What services can be offered by the HIE?
- What are considered core services and value-add services today versus in the future?
- How will value-add services be managed between community and state exchanges?
- What is the value of the services offered?
- What is the cost to deliver the services?
- What capacity do data users have to pay for the services?
- Do technical requirements limit who can use the exchange?
- What privacy policies limit revenue source opportunities?
- What is the probability of HIE competition in your market?
- How will changes in the local and national market affect your sustainability?

There are a number of additional factors HIEs should consider when building their sustainability model. The most pressing consideration is the short life span of the current funding. Federal funds are not a viable, long-term sustainability option for community or state-run HIEs. Therefore, it is important that HIEs consider using public funds only for startup and implementation costs. Grant monies should not be relied upon for ongoing operational costs.

Product selections, infrastructure, and implementation processes directly impact the ongoing maintenance costs of the exchange. Ongoing license and maintenance fees can vary based on the products selected and level of customization required. Some products have small startup costs, but are more expensive to customize and maintain over time. In addition to cost, HIEs should consider the range of functionality required to provide valuable services. According to Raul Recarey, the COO of the West Virginia Health Information Network, "Vendor selection is key to managing ongoing costs. As the market becomes more competitive, having the right vendor cost structure will ensure an HIE can successfully compete in the market space."

As the market develops, HIEs should continually review and track the existing competition. HIEs should consider collaborating and coordinating with other community and state-run HIEs when possible. As value-add services become core services, organizations will be searching for new and innovative services to support sustainability.

In determining the best path for HIE sustainability, leaders must consider a unique mix of cost and revenue streams. These considerations are critical to explore early in the development process, as they will ultimately determine the viability of the exchange.

Most importantly, a clear value proposition of participation is critical to providers and hospitals. The benefits of participation in an HIE must always exceed the cost of participation, if the HIE is to remain sustainable.

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REFERENCES

[1] Health Information Exchange Economic Sustainability Panel: Final Report. NORC at the University of Chicago. Prepared for the U.S. Department of Health and Human Services Office of the National Coordinator for Health Information Technology. April 2009.

[2] Original Funding Opportunity Announcement: State Health Information Exchange Cooperative Agreement Program. http://healthit.hhs.gov/portal/server.pt?open=18&objID=888442&parentname=CommunityPage&parentid=55&mode=2&in_hi_userid=11113&cached=true

[3] Original Funding Opportunity Announcement: State Grants to Promote Health Information Technology (Health Information Exchange Challenge Program) http://www07.grants.gov/search/downloadAtt.do;jsessionid=n5P4NL0GLTQF1v7QDzvtjBh2r3PnZvxGGmvL9RwGPbRc1vG6z0vV!-1027908442?attId=48040

[4] Original Funding Opportunity Announcement: Beacon Community Cooperative Agreement Program. http://www.grants.gov/search/downloadAtt.do;jsessionid=yv9JNLyGQwJvMjQn1tq1rv232R31bt9p1GZxf3Rg7Y41sHSG3qKb!-1027908442?attId=38366

[5] Original Funding Opportunity Announcement: Strategic Health IT Advanced Research Projects Program. http://healthit.hhs.gov/portal/server.pt/gateway/PTARGS_0_11673_910044_0_0_18/oppHHS-2010-ONC-TR-005-cfda93.728-instructions.doc

[6] Health Information Technology for Economic and Clinical Health Act, Pub. L. 111-5, div. A, title XIII, div. B, title IV, Feb. 17, 2009, 123 Stat. 226, 467 (42 U.S.C. 300jj et seq.; 17901 et seq.), specifically 42 USC Sec. 300jj-33.

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The eHealth Initiative (eHI) is an independent, non-profit organization whose mission is to drive improvements in the quality, safety, and efficiency of healthcare through information and information technology.

Working with its member organizations, eHI works to create a world where consumers, healthcare providers, and those responsible for population health will have ready access to timely, relevant, reliable, and secure information and services through an interconnected, electronic health information infrastructure to support better health and healthcare.

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