Rural Healthcare Information Technology
Adoption Project

RHIO Formation Guide

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Section 1 – Introduction

The purpose of this guide is to acquaint you with the things that you need to consider when planning a Regional Health Information Organization (RHIO) for your community. This guide will help you identify and understand the activities that you need to include in your RHIO development plan. The RHIO Formation Guide (Guide) is not intended as either a RHIO operations guide or a project management model. There are other sources of information for those. The suggested activities in this guide are meant to help you through the early stages of developing your RHIO and to assist you to the point of a pilot phase where you can successfully exchange some data in a controlled environment. By following the suggestions in this guide, you will be well positioned to take the next steps to turn your RHIO into an operational entity.

Every year in the United States, we spend over $6,000 per person on healthcare. In 2006, our total healthcare bill was over $ 2,000,000,000,000 ($2 trillion). That's over $5,480,000,000 (nearly $5.5 billion) every day. Yet, when compared to other industrialized nations whose per capita spending does not even approach ours, our quality of care ranks at 39th. That quality of care is reflected in high infant mortality rates, fragmented chronic disease care, and variability in access to care. We are getting a poor return on our healthcare dollar.

One study published in 1999 by the Institutes of Medicine reported that over 98,000 patients die in our hospitals every year due to medical errors. That's the equivalent of a large airplane crashing every day with over 270 casualties.
A paper-based operation of the US healthcare system is the standard our parents, grandparents and great-grandparents were accustomed to. Paper records were kept within each doctor's office, within each hospital, and by the individual. Sharing of information only happened when patients physically took copies of their records or the large packs of x-ray films with them to their doctor appointments.

But, this is the 21st century and we have the tools and the opportunities our grandparents could not even have dreamed possible. We can be part of a revolution that will improve healthcare and realize the vision of:

Having my health information, correct, complete, and current,
available to me – and my healthcare provider –
when and where I need it
so I can receive the best possible care.

We can make all of a person's relevant health information available electronically, when and where it's needed. This means that together with our healthcare providers, we can make the best possible decisions regarding the healthcare that is right for us at the exact time that we need care.

This Formation Guide

The State of Arizona has engaged Mosaica Partners, a nationally recognized health information exchange consulting firm, to assist you in organizing and presenting the information you need to plan, or further develop, your RHIO.

In this guide you will find information on what you can do to make health information more available in your community. We hope that you can be among those making a difference in the future of healthcare delivery.

Section 2 – What is Health Information Exchange (HIE)?

Health Information Exchange (HIE) and RHIOs

HIE is defined as, "the mobilization of healthcare information electronically across organizations."[1] It provides the capability to move clinical information electronically between disparate healthcare information systems while maintaining the meaning of the information being exchanged. HIE is an electronic means to facilitate access to and retrieval of clinical data in order to provide safer, more timely, efficient, effective, and equitable patient care.

To make this information available we must enable all organizations that contain information about our health and healthcare to be able to share that information with others who need it to provide our care. Formal organizations have emerged in many regions and states over recent years to provide both technology and governance support for HIE efforts. These organizations are often called Regional Health Information Organizations or RHIOs. RHIOs are collaborative organizations that bring together stakeholders within a defined geographic or interest area and govern the electronic exchange of health-related information among them for the purpose of improving health and care. A RHIO is the organization responsible for safely and securely exchanging health information.

The National Perspective

The United States federal government has recognized the importance of moving the country toward adoption of Electronic Health Records (EHRs) and Health Information Exchange (HIE). In 2004, the President issued an Executive Order that provided leadership for the development and implementation of a nationwide Health Information Technology (HIT) infrastructure intended to improve healthcare quality and efficiency.[2] This executive order created the Office of the National Coordinator for Health Information Technology (ONC) whose mission is to provide national leadership for developing a nationwide Health Information Technology infrastructure. A number of federal initiatives have been created by ONC and other federal departments to address HIT issues.

[1] eHealth Initiative. (2005). eHealth Initiative Foundation's Second Annual Survey of State, Regional and Community-Based Health Information Exchange Initiative and Organizations- Release August, 2005 Definition and Select Characteristics of HIE Initiatives. Washington, DC.

[2] The White House Office of the Press Secretary. (4/27/2004). Executive Order: Incentives for the Use of Health Information Technology and Establishing the Position of the National Health Information Technology Coordinator. Washington, DC.

Arizona Approach

Arizona is seen as a leader in moving forward with health information exchange. The following describe some of the key initiatives that Arizona is engaged in around health information exchange.

Arizona Health-e Connection Roadmap

In 2005 Governor Napolitano signed Executive Order 2005-25. This order resulted in the Arizona Health-e Connection Roadmap (Roadmap) to support the widespread adoption of interoperable electronic health records in Arizona and to improve quality and reduce the costs of healthcare in Arizona. With leadership by the Director of the Government Information Technology Agency (GITA), a Steering Committee, and Task Groups, the Roadmap was created. The Roadmap can be found at http://www.azgita.gov/tech_news/2006/Arizona%20Health-e%20Connection%20Roadmap.pdf.

Arizona Health-e Connection

The Arizona Health-e Connection (AzHeC) organization was formed as directed in the Roadmap. Its mission is "To facilitate the design and implementation of integrated statewide health data information systems that support the information needs of consumers, health plans, policymakers, providers, purchasers, and researchers and that reduce healthcare costs, improve patient safety, and improve the quality and efficiency of healthcare and public health services in Arizona."

Arizona Health Privacy Project and Arizona Health Security Project

The State of Arizona was awarded multiple grants to participate in the Health Information Security and Privacy Collaboration (HISPC) project to explore privacy and security issues related to electronic health data exchange. This is a multi-phase project. Phase One, the Arizona Health Privacy Project, addressed barriers to business practices that would inhibit the implementation of HIE and legislative issues around legal barriers to HIE. Phase Two of the Project addressed policies and procedures for allowing provider access to the RHIO for treatment purposes. In 2008, Phase Three, the Arizona Health Security Project, will address security policies around authentication and audit for provider access to the RHIO. This is a ten-state collaborative formed to develop a basic set of interstate and intrastate policy requirements.

Rural Health Information Technology Adoption Grants

The Rural Health Information Technology Adoption (RHITA) Grant Program was created to facilitate the adoption of health information technology (HIT) by Arizona rural healthcare providers.

AHCCCS Health Information Exchange and Electronic Health Record Utility Project

This is a web-based health information exchange (HIE) utility to give all Medicaid providers instant access to patient's health records at the point of service. The Federal funds from a Medicaid Transformation Grant are being used to support the planning, design, development, testing, implementation, and evaluation of the AHCCCS Health Information Exchange and Electronic Health Record (HIeHR) Utility.

Southern Arizona Health Information Exchange (SAHIE)
The mission of SAHIE is to improve the access, quality, and safety of healthcare while reducing or stabilizing costs in Southern Arizona through the deployment of regional and self sustainable health information exchange.

References

1. Arizona Health-e Connection Roadmap http://www.azhec.org/documents/Arizona%20Health-e%20Connection%20Roadmap.pdf

2. Arizona Health-e Connection http://www.azhec.org/

3. Attitude and Opinion Research, "A Majority of Consumers Favor Secure Electronic Health Information Exchange," eHealth Initiative Foundation, May 2007. http://toolkit.ehealthinitiative.org/assets/Documents/eHISummaryofResearchonHealthInformationExchange05.01.07Final001.pdf

4. eHealth Initiative Foundation Communication and Outreach Tools and Resources http://toolkit.ehealthinitiative.org/communication_and_outreach/partnership_tools.mspx

Section 3 – How this Guide was Developed

We have created this guide using the best data and information from the many sources available.

The guide includes adapted material from important work in the industry and acknowledges significant contributions from the following organizations:

- Agency for Healthcare Research and Quality, Health Information Technology
- American Health Information Management Association Foundation of Education and Research (AHIMA/FORE)
- Arizona Health-e Connection Roadmap
- eHealth Initiative Foundation
- Interagency and Department of Health and Human Services (HHS) initiatives coordinated by the Office of the National Coordinator for Health Information Technology
- Healthcare Information and Management Systems Society (HIMSS)
- Markle Foundation

Mosaica Partners has been involved in RHIO/HIE design and implementation for several years. Specifically, they have significant experience working with rural communities like the ones served by the Arizona Rural Healthcare Information Technology Adoption (RHITA) grant. They have thoroughly researched the activities of successful and unsuccessful RHIOs and developed an approach to aid you in your communities' efforts to build a RHIO.

Mosaica Partners' method is built on their experience building RHIOs and takes into consideration important national and state level trends in health information exchange as well as applicable legislation and regulations. They have built a solid foundation of HIE formation strategy into a functional methodology

This experience and methodology will provide you with guidance on RHIO development, creation of governance structures, financial modeling for sustainability, privacy and security, education and community development, and the identification and understanding of the various value propositions for each healthcare sector.

This combined knowledge, experience and best of the industry research forms the basis for this Formation Guide.

Section 4 – How to Use this Guide

This guide is a combination of theory and practical hands- on advice. It describes how to plan and establish a Regional Health Information Organization (RHIO) in your community. There are sections that introduce the concept of RHIOs and HIE and describe the many benefits that can be realized by establishing a RHIO. You will find the information in these introductory sections valuable as you communicate with others in order to build the critical mass of community members necessary to effectively plan for a RHIO.

The largest section of this Guide relates to the nine essential domains that make up a successful RHIO. These nine sections are important because they detail the attributes of a successful RHIO. They help paint a picture of your objective and tell you how to get there.

In each section you'll find a definition of the domain, a statement of why that individual component is important to the success of a RHIO, and a list of suggested activities you and your fellow community members can undertake. In addition, each of the nine sections contains key considerations, helpful insights to guide your activities and possible outcome measures which you – and the State – can use to measure your progress. Each section also includes references to other documents or web sites on that subject. You will find those references useful if you want to research that component in more detail. In many cases, actual links to online documents and web sites are provided.

The Guide concludes with a summary of the information that has been presented and specific suggestions on how it can be used.

Section 5 - The Benefits of HIE

The entire healthcare system in the United States is undergoing a major transformation. It is moving from a provider-centric system to a consumer/patient-centric system. Three demographic trends are major drivers of this transformation. First, as members of the baby boomer generation age, they are demanding more control over the delivery of their healthcare. Second, each generation is becoming more technically savvy than those who have gone before. Finally, the advent and growth of HIE provides the enabling tools consumers/patients need to assume more control over their health information and planning.

Improve quality of healthcare and reduce costs
The benefits from HIE encompass a wide variety of goals and people. Ultimately health information exchange will enable improvements in the quality of healthcare and achieve a reduction in cost.

HIE directly supports these goals by making all relevant information available to the physician and the patient at the point of care. Coupled with decision support capabilities, this change alone has been shown to reduce medical errors. Knowing that the patient has recently had laboratory or imaging tests done and having their results available can dramatically reduce the amount of redundant and time-consuming additional testing.

Today, a large portion of the work in healthcare is devoted to chasing paper. The resources used can be better used and redirected toward patient education or chronic disease management if all patient information is available when needed. Phone calls between physician offices and pharmacies or labs could be dramatically reduced if prescriptions were easily read and lab results readily available.

Public health departments have much to gain from ready access to electronic health information. For example, disease outbreaks could be detected and contained sooner.

Healthcare future vision
With improved health information availability through electronic health information exchange, we could see the implementation of a healthcare system where:

- Healthcare providers could expand their current focus on episodic, acute care to encompass the enhanced management of chronic diseases and the life-long prediction and prevention of illness
- Payors and health plans could help consumers remain healthy, get more value from the healthcare system, and assist care delivery organizations and clinicians in delivering higher value healthcare
- Consumers could assume personal responsibility for their health and for maximizing the value they receive from a transformed healthcare system

In fact, each sector of the healthcare industry has its own, unique value proposition. A value proposition simply defines what someone perceives as their direct benefit from proactive participation in HIE and a local RHIO. Understanding the value proposition that will motivate the various stakeholders to join a RHIO is a necessary component of your design. Satisfying these different value propositions so each stakeholder sees exactly how they will directly benefit by joining your RHIO is a certain path to success.

Value Propositions

There are three value propositions that seem relevant to all stakeholders regardless of their particular position in the healthcare system:

The Shift to Consumer Driven Healthcare
In 2004, President Bush signed an order setting a goal for each person in the United States to have a personal health record by 2014. Although HIE development has been in process for many years, this Executive Order can be seen as the beginning point in the transformation of healthcare delivery in the United States. HIE activity is taking place in many states. Corporate giants such as Microsoft and Google are now introducing personal health records for consumers. It is simply a matter of time before consumers, instead of payors, are directly participating in, if not controlling their own healthcare. At that point the entire system becomes consumer/patient-centric. As with any transformative process, the early adopters will gain the most benefits and have the greatest ability to shape the future.

The Opportunity for Improving Overall Healthcare Quality
With a fully implemented HIE system across the country, the overall quality of healthcare will rise. Recent studies indicate over 98,000 patients die each year due to clerical medical errors and more than 1,000,000 serious medication errors occur annually. The United States spends nearly twice as much per capita as any other nation and ranks only 39th in the developed world in overall healthcare quality. HIE can and will address and reduce many of these problems and generally improve the delivery of healthcare. In addition, quality improvements can also be expected through:

- Patient-specific information availability at the point of care to improve the quality of treatment

- Healthcare improvements for the underserved and uninsured populations

The Ability to Enhance Healthcare System Efficiency
Recent studies have estimated that $100 billion per year is spent on redundant treatments and mistakes. Given the rapid rise in healthcare expenditures (15% of GDP rising to 19% by 2015), HIE can deliver better accuracy for lower costs and help restrain the growth of healthcare expenditures for everyone. Some of the efficiencies gained from HIE include:

- Patients can get enhanced services through e-visits, reminders, scheduling, prescription refills, and many other services now requiring timely and costly provider visits.
- Patients and providers can receive their lab and imaging results online for real-time care and greater efficiency.
- Patients and providers have new capabilities to collaborate with shared case management tools, identification of best practices and consultation with experts worldwide.

Stakeholder benefits by sector
In addition to these three general benefits everyone receives, each separate sector in the healthcare system accrues benefits that are somewhat unique to that sector. While some of the benefits described below are shared by various sectors, they provide the greatest benefits to those sectors where they are described.

A. **Consumers**
   1. Improved Quality
      Consumers/patients will enjoy better healthcare as HIE become available. In addition to the general benefits described above, consumers/patients will be able to:
      - Eliminate repetitive forms and explanations about health history
      - Have their medical history available to them and their provider wherever they are and whenever they need it
      - Have their critical health information immediately available to them in times of emergency
      - Reduce unnecessary and/or duplicate drugs, tests and/or visits
      - Have their health records protected in times of natural disaster

   2. Lower Costs
      More and more employers and third party healthcare insurers are requiring consumers to share a larger portion of the cost for their healthcare. The percentage of the insurance premium that the consumer is now required to bear is increasing every year as is the out-of-pocket deductible. As our healthcare costs continue to rise, so will the amount each individual is required to pay. By moving to health information exchange and significantly reducing the amount of duplication and inefficiency in our system, we can begin the process to lower the costs borne by each individual.

B. **Hospitals**
   1. Competitive advantage
      Given that HIE is coming to every community, hospitals can gain a distinct advantage by leading the transformation to HIE. Consumers are increasingly aware of hospitals that can provide them with their

healthcare information electronically and will choose hospitals based on their ability to provide this level of service. In addition, hospitals adopting HIE are looking forward to an electronic future where they can connect with patients in a variety of new ways and offer a variety of new services.

2. Higher profitability
   In a study done by the Southern Arizona Health Information Exchange (SAHIE), the participating hospitals are projected to realize a net positive cash flow in only 2.3 years. SAHIE's initial ten-year financial projection indicated their overall return on investment would be in excess of 117%.

C. **Physicians**

1. Improved Service
   Physicians will see a level of improved service for their patients. On-line scheduling, the reduction of faxing and copying of records, and capturing the patient's medical history are benefits for the patient as well as for the physician. Shorter wait times, faster lab and imaging results and e-prescribing are service improvements awaiting physicians who adopt HIE quickly. These physicians will have additional time for clinical interaction with each patient, as well as time to see more patients per day.

2. Enhanced Profitability
   There are numerous opportunities for the physicians to benefit from the use of HIE. Many activities that improve levels of service also lead directly to enhanced profitability. For an office copying patient records, sending and receiving faxes, and couriering lab and image results between locations, the savings can be substantial. There may also be additional monetary and time savings resulting from the faster processing of insurance claims.

D. **Communities**

1. Economic Competitiveness
   In almost every survey of "Great Places to Live/Work," the quality of medical care is one of the key factors in rating and comparing communities. The ability to attract and retain the best and the brightest providers in any community is a distinct advantage and will lead to higher ratings. Companies that are looking to relocate or expand consider this factor in choosing communities. HIE is one major tool for upgrading the quality of care in any community.

   In addition, recent medical school graduates are already technology competent when they enter the workforce and have an expectation of operating in an electronic environment. Communities that are well along the HIE path have a clear advantage when recruiting the highest quality providers to their area.

2. Better Healthcare
   The ability to recruit the best and the brightest providers into a community leads to higher quality care. Both primary and acute care providers prefer

to be in an environment where they can interact with and have access to specialists with a variety of skills and competencies. When a community has good provider talent, it will tend to attract more and better provider talent. Having more provider capabilities in a community gives that community the ability to provide better healthcare. Success breeds success.

E. **Payors**

1. Lower Costs

Payors are often forgotten as key stakeholders in early RHIO formation activities. However, their support and inclusion is important as an organizational achievement. Payors benefit from the improved efficiency and the avoidance of redundant tests that result from EHR adoption and HIE. This efficiency and improved operation has a significant financial impact as well. It has been estimated that payors could save over $20 billion annually.

2. Better Actuarial Information

The benefits are not just about money. Payors would benefit from comparative performance reports on the quality of care delivered by providers in the community. This is true particularly at the individual provider level and for measures that have significant actuarial importance and are difficult to gather without going through medical records

F. **Labs and Imaging**

1. Higher Profitability

The current process of copying and faxing results, used by so many labs and imaging entities is expensive. Most of the major labs and imaging centers already have the patients' results in an electronic format. Duplicating and distributing results to the primary care providers adds expense. Reducing duplications and transmitting results electronically yields savings to both the sender and the receiver of the information.

2. Better Customer Service

Reducing the faxing and couriering of results between the lab/imaging entity and the primary care provider will provide better service. Results can be reported more quickly and more accurately using HIE. Receiving results sooner reduces patient anxiety and is likely to increase satisfaction for both patients and healthcare providers.

G. **Employers**

1. Healthier Employees

HIE provides the tool for improved healthcare for all consumers/patients. As described in the benefits of the other sectors, improvements in the delivery of healthcare outcomes results in an overall improvement in the general health of the population. Employers directly benefit by having healthier employees who are more productive and lose less work time to illness.

2. Competitive Advantage
   HIE is an advantage to employers who can provide access to this service. Particularly with younger workers entering the workforce, expectations for having control over their own healthcare are high. They are capable of using HIE to promote healthier lifestyles and to gain control over their own care. Employers providing HIE for their employees will have an advantage when it comes to recruiting and retaining top level talent.

3. Lower Healthcare Costs
   It is reasonable to expect employers to enjoy the benefits of lower healthcare costs based on the improvements brought about by HIE. As described in this report for many of the other sectors, HIE will reduce the overall costs of healthcare. Lower healthcare costs will eventually result in lower healthcare premium costs to employers. Employers, one of the main funders of the healthcare system, will see a direct correlation between their costs and improvements in care.

H. **Government**

1. Reduced costs
   Government is one of the major payors, users, and regulators of the healthcare system. Moving to HIE can directly reduce the overall cost of government spending on healthcare. The government benefits from both reduced costs as well as from a healthy population.

2. Better Responsiveness to Medical Crisis (bioterrorism, pandemic, epidemic)
   Government has a critical role to play in dealing with a variety of medical crises/events that may occur in any community. In controlling the rapid spread of a contagious disease and/or dealing with bioterrorism, having immediate access to key information is critical to a quick and decisive response. HIE provides exactly the type of speed and accuracy needed to respond to a public health crisis.

Section 6 – The Process for Building a RHIO

A. Getting started

While the effort involved in planning, developing, and implementing a RHIO is not a trivial matter, it is important to recognize that others have preceded you. Therefore, there is a well-documented collection of information concerning the lessons they learned as a result of their successes (which you *do* want to understand and incorporate) and the mistakes they made (which you *do not* want to repeat).

Because of the efforts of those who went before, you have access to a large number of validated approaches, standards, and conventions that can assist you in the development of your RHIO. Many are contained in this guide. You will learn that there are things that should not be done at all and some other things that should be done in a certain order. Understanding and using these collected approaches, standards and conventions will ensure you are making the best use of your two most important resources – time and money.

B. The need for validated approaches, standards, and conventions

Planning and building a successful RHIO is similar to successfully establishing any organization or building any object. You could ignore all the accumulated knowledge and strike out on your own or you could make use of the accumulated knowledge in that specific field.

For example, building and attempting to fly an airplane without knowing and applying the laws of aerodynamics would be disastrous. Similarly, trying to build a solidly constructed house to protect you and your family from the elements without constructing a proper foundation or roof would be considered a wasted effort.

GITA wants to improve your community's chances of success. Therefore, we are encouraging you to understand and incorporate the validated approaches, standards, and conventions contained in this Guide that are relevant to your situation.

C. GITA's RHIO formation approach

A RHIO can only be considered successful when certain required capabilities are present and the RHIO is in conformance with established standards and conventions. Thus, the approach described in this Guide focuses on identifying the actions or activities that must be completed to ensure those capabilities are in place. At the same time, the organization must understand and conform to

established standards and conventions. This collective approach can be thought of as a roadmap to be followed on your journey to building a successful RHIO.

D. The nine components of RHIO success

Planning and building a RHIO is accomplished by completing a series of actions or activities over time. Based on the research and methodology development mentioned earlier in this Guide, as well as important considerations related to applicable legislation and regulations, we have documented suggested RHIO formation actions and activities and segmented them into nine logical areas or domains. Understanding these nine domains and the relationships among and between them makes it easier to understand and accomplish the required actions or activities.

The domains are:

A. Community Leadership
   The recognition by a critical mass of healthcare provider leaders that a RHIO has value and should be pursued for the betterment of the community

B. Business Foundation
   The business case for designing and building a RHIO in your community including the vision and mission of the RHIO and the value proposition to engage your stakeholders

C. Governance
   The process of defining expectations, roles and responsibilities, decision-making, and accountability for the RHIO

D. Privacy and Security
   The protocols selected to protect data and information from exposure to accidental or inappropriate disclosure, unauthorized access, modification, removal or destruction, and/or unreasonable interference with individual rights to protection of information

E. Technical Architecture
   The hardware, software, applications, networks, standards, and protocols selected to connect stakeholders that enable them to share data and information in accordance with RHIO governance and operating agreements

F. Community Outreach
   The engagement of stakeholders, legislative representatives, consumers, and users of RHIO services in support of the RHIO's mission, vision, growth, and development

G. Economic Sustainability

The state of the RHIO that can be maintained at a satisfactory financial and operational level indefinitely

H. Education
The teaching and learning of specific skills, imparting of knowledge, and development of wisdom about the processes, tools, and techniques for a successful transition to a RHIO

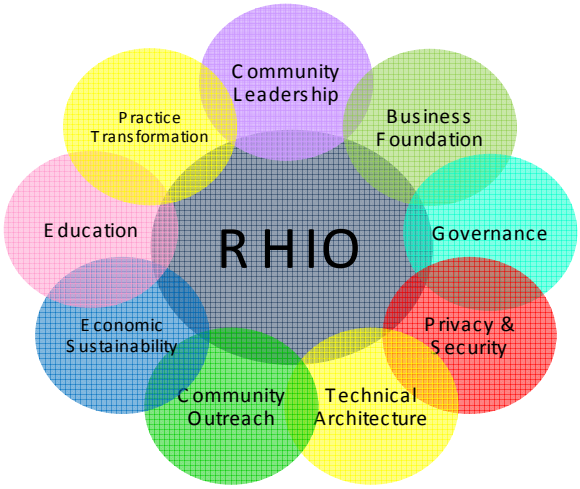
I. Practice Transformation
The art of aligning processes, procedures, and systems of a particular practice to the operational processes, procedures and systems of the RHIO

E. Understanding the role of the nine domains in RHIO formation success

While the activities within each domain are both important and critical, it is the cumulative effect of all of the actions and activities across all the domains that enable a RHIO to be considered successful. In some cases, activities undertaken in one domain will also impact other domains. For example, determining how you will handle certain privacy and security issues will also impact the business development and the technical architecture domains. Because of this, working within domains is an iterative process, not purely sequential.

A RHIO can only be considered successful when sufficient capabilities are present in each of the nine domains. In an effort to show how these nine logical domains interrelate – and how they are all required to make up a successful RHIO – we have shown then as forming a circle in Figure 1 below.

Figure 1 – The Nine RHIO Formation Domains



By understanding the capabilities that must be present to make up a fully functional and fully capable RHIO – referred to as the desired future state – you'll be able to see how your individual actions and activities will result in the presence of those required capabilities. You'll see the direct correlation between your actions and activities and the capabilities that must be in place in a successful RHIO.

F. Using the nine domains to plan your work

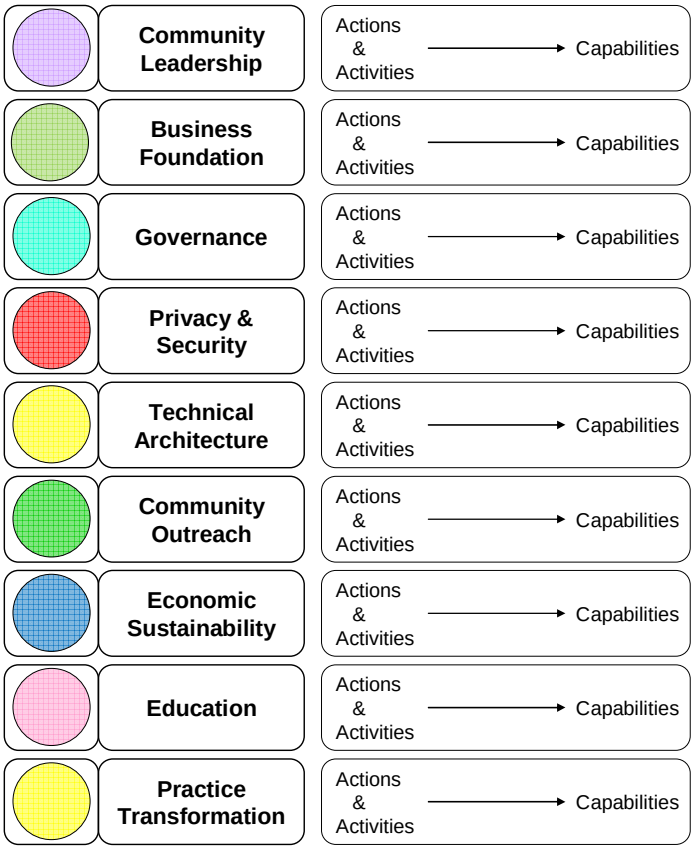
While there are nine logical domains involved in building a successful RHIO, planning your work isn't as simple as completing all the suggested actions or activities in one domain and then going on to the next in a simple sequential fashion. That is because you'll learn new things as you complete various actions or activities in one domain that may cause you to revisit an assumption or decision you previously made in another domain. As a result, you may have to revisit a domain and make an adjustment within a domain that you have already addressed. Or, you may have learned new information that will have an impact on a domain you have not yet addressed.

For example, let's say you have defined your requirements for the technology architecture based on a certain business model your RHIO developed earlier in the planning process. Your RHIO may have an estimate in mind as to how much the technology will cost. If you find that the costs are much higher than originally forecast, you will need to circle back to the business model in the business foundation domain and recalibrate. If the business requirements remain the same, you may have to revisit and adjust your technology requirements.

This iterative process will continue until your RHIO strikes the proper balance between costs and benefits for your area. Situations like this will happen. As in any business, a change or new information in one area often impacts another area. This dynamic also exists in planning and developing a RHIO, so you should be prepared to revisit some of your earlier decisions as you move through the process. Remember, it is best to consider approaching the nine domains both individually and in an iterative manner as opposed to approaching them in a simply sequential manner.

To show how these nine logical domains can be used to group the various actions and activities needed to plan and develop a RHIO, and how they result in required capabilities, we have shown them as individual tracks in Figure 2 below.

Figure 2 – Using domains as action and activity tracks



Note that completed actions and activities within a domain will result in the presence of essential capabilities in that domain.

G. Measuring your progress

Because the approach recommended here is based on a capability model, where capabilities must be present, this approach also enables a forming RHIO to measure its progress as it moves from the planning stage to the development stage and finally to implementation.

Standardized measures have been developed for each domain, starting with the planning stage, and ending at a point where you are prepared to successfully exchange some data in a controlled environment. Measurement of progress is accomplished by assessing and understanding the presence of essential

capabilities in each of the nine logical domains. Examples of the types of measures that can be used are provided later in this guide. Valid measurements of progress are essential and you and your stakeholders will find them valuable.

Section 7 – The Nine Domains of RHIO Formation

This section describes each of the nine domains of RHIO formation in more detail. It is intended to provide a foundation upon which you can build your RHIO formation plan. As mentioned in the previous section, the formation of a RHIO is not a strictly linear process. In other words, it is not the intent of this guide that you progress sequentially from one domain to another and never revisit a previously addressed domain. Instead, you will find yourself developing initiatives that will, by necessity, involve activities in multiple domains.

You may find that decisions made at later stages in your formation will require you to revisit decisions made in earlier stages. Developing a RHIO requires an iterative approach that may require several passes through the domains. Remember to keep your eye always on the ultimate goal – which is defined as the Desired Future State – of each of the domains.

Organization of this Section

Each domain sub-section is organized in the following way:

Desired Future State
This is a description of what the future will look like when the formation stages of the RHIO are complete. You are urged to think of this in terms of the goal you are working towards.

Why Important
This section describes the key reasons why a particular domain is a critical component in RHIO formation. It provides information for you to use as you work with your community and it underscores the importance of including the activities in each of the domains.

Activities
The activities are examples of the types of actions you will want to consider including in your formation plan. You will often find that you will need to include activities in multiple domains to achieve a desired goal. It is not intended that you complete all activities within one domain before moving on to another domain. Building a RHIO is as much about art as it is science and it is all about knowing your community. If you plan your goals and activities around this knowledge, you will increase your odds of building a successful RHIO.

Key Considerations
These are intended as points you will want to make sure you consider in your planning. Some of these points have come about as lessons learned from previous RHIO development activities. Others are adapted from best practices in other industries. Either way, you will want to make sure you address them.

Outcome Measurements
It is important to determine how you will know whether or not your efforts are making progress. This section offers several suggestions of ways to measure your progress. Many times progress in the development of a RHIO is intangible or not readily evident. By identifying specific observable outcomes, you make the intangible into the tangible. It is important all through the development of your RHIO to be able to show to the core team and to the community the progress you are making.

Reference Sources
Because it isn't possible to include every possible action, measurement, or example in this guide, we have included a section that refers you to additional sources of quality information on each of the respective domains.

Section 7 Domain A – Community Leadership

A. Desired Future State

The recognition by a critical mass of key stakeholders, including healthcare providers, that HIE has value and should be pursued for the betterment of the community.

B. Why it is important?

Without leadership and a willingness to take a risk, HIE will not succeed. When community stakeholders recognize the value of HIE, they will act and become organized to create your RHIO. Successful RHIOs are built on a solid foundation of community leadership. The earlier the leadership comes together, the better. It is more difficult to build community leadership during the later stages of formation.

When key stakeholders in a given area fully participate in a RHIO, patient and consumer data and information will become readily available for exchange. The quality of healthcare will be improved throughout the community and your RHIO will be considered successful.

A December 2007 Harvard University study linked the success of several RHIOs to community support, development of key stakeholders' interest, and demonstration of benefits to stakeholders. Emphasis early on should be on the engagement of key decision-makers, stakeholders, and the community. You should determine if your community is ready for HIE before proceeding too far.

C. Activities

Engage key decision-makers
Your community needs to identify and engage the key decision-makers and groups in your area.

Consumers must be involved early on. They are important drivers for HIE and will be instrumental in generating the demand for health information availability.

Hospital interest in HIE involves better patient care, cost savings and increases of safety. However, typical concerns from hospitals involve the ownership of clinical data and privacy issues. Hospital representation is extremely important to your success as they are frequent funders of HIE. As consumer satisfaction of hospitals continues to fall, improved quality of care due to HIE may be a powerful motivator for this group.

Physicians need to be involved in understanding the benefits of HIE. For health information exchange to succeed, physician adoption is paramount. Major benefits of HIE for physicians include better patient care, improvements in efficiency, and a reduction in costs.

Employers and healthcare purchasers will have a role in making HIE successful in any community. It is important to be prepared to discuss their concerns about HIE. These concerns include privacy, healthcare costs, ownership of the information, and access rights.

Labs and pharmacies may also have a key role in HIE. They are frequently one of the early adopters of HIE technology and can significantly reduce their operating costs by joining a RHIO.

Identify broad stakeholder group

In order to build stakeholder support, it is important to identify who needs to be involved. Your RHIO must have an understanding of the needs of each stakeholder group. In addition, ensure you have a diverse group that represents your community and reflects several of these important healthcare areas:

- Academic - Medical / Informatics / Research University
- Behavioral Health
- Community Health Centers and Rural Health Clinics
- Consumer and Patient Groups
- Department of Health (State, County and City)
- Economic Development Organizations
- Emergency Medical Services Providers
- Government – Local and Federal
- Health Plans and Payors
- Hospitals
- HIE and HIT Initiative Representation
- Laboratories
- Long-term care providers
- Medical Societies
- Military and Veterans Administration
- Nurses
- Pharmacies
- Philanthropies / Foundations
- Physicians and Physician Practices
- Public Health Agencies
- Tribes
- Union representation / Labor
- Vendors (as appropriate)
- Visiting Nurse Association
- Other healthcare providers

It is important to identify the project parameters for creating your RHIO. Develop a plan outlining the short-term goals and services that the RHIO project will provide from the start. Understand how community leadership links in with the other eight domains and how you will proceed forward. The important concept is to build momentum and to use it to begin to move forward.

Assess Community Readiness
One early step to take is to assess your community's readiness for HIE. Determine if you must spend more time in the planning stages educating the community and the leadership about HIE before moving forward. Understand if your community is aware of current HIE efforts. Convene meetings, conduct surveys and talk with people to assess their knowledge about HIE as well as their readiness to move forward with creating a RHIO in your community. Your community leaders may not be ready to move forward today, but you can still lay the foundation for the future possibility of RHIO formation.

High level community education
Educating the community about HIE is also important. Consumers need to be made aware of the benefits they will receive from HIE. Some of these benefits involve reduction of duplicate/redundant tests, availability of critical health information, mobility of medical history and avoidance of adverse drug interactions. Consumers also value having access to their own information, yet are very concerned about privacy of the information.

An early step in the process is to define your community and determine how your RHIO can get the message out to the community about the value of HIE. Several methods have been successful in other communities, including meetings/workshops, outreach events, health expos, pamphlets, and materials on HIE background, achievements, and RHIO membership.

Privacy and security
Although Privacy and Security is a separate domain, you should begin to anticipate what impact consumer and provider concerns in this area might have on your outreach activities. You should make sure that your description of the potential community benefits takes into consideration possible sensitivities regarding privacy.

Additional activities
The following list suggests some of the activities that you should complete during the Community Leadership domain work. Please note these activities are not listed in sequential order. Activities in multiple areas and even multiple domains may be occurring simultaneously

- Build Stakeholder Support
- Engage the Key Decision Makers
- Identify the RHIO Project Parameters
- Assess community readiness for HIE
- Educate the Community About HIE

Key Considerations

There are several key considerations involving Community Leadership that you must assess before moving forward. Although Community Leadership may appear to be sufficient at a certain point in time, the process of RHIO formation may require a return to this domain to reassess the level of support of your Community Leadership. Additionally, this allows you further opportunities to identify how to grow participation in your RHIO.

Key Considerations
• Trust is paramount to building a successful RHIO. Informing and educating your community leadership is a first step to building that trust. • Create a mission and/or vision statement and name leadership for your RHIO early. • Engage stakeholders and form committees. • Identify barriers in the local community and external community. Are there political and specific local concerns to address? • Ask questions and identify needs before defining benefits to stakeholders. Assemble and share this information. • Focus on building trust at this stage to grow interest and participation. • Determine whether the community understands that they need HIE.

D. Examples of Outcome Measures

RHIO leadership may be required to collect data and analyze performance over time. This is necessary to show progress as you build your RHIO. You are encouraged to collect data for several outcomes, as it will be helpful when speaking to stakeholders, consumers, members of the community and potential funders. Establish a baseline for your measures so that during the project you can show progress whenever possible.

Examples of Outcome Measures
• Increase in community participation through HIE committee formation and regular meetings. • Increase in community leaders' meeting attendance and willingness to contribute time/money/other assistance. • Stakeholder commitment of time or other assistance has exceeded the goal of X by Y%. • Community Readiness Pre- and Post-test survey increase.

E. Reference Sources

1. eHealth Initiative Foundation, Getting Started Resources. http://toolkit.ehealthinitiative.org/getting_started/resources.mspx
2. eHealth Initiative Foundation, Getting Started Roadmap. http://toolkit.ehealthinitiative.org/getting_started/roadmap.mspx
3. eHealth Initiative Foundation, pamphlet "Physicians and Health Information Exchange. What healthcare providers need to know" 2006. http://toolkit.ehealthinitiative.org/assets/Documents/eHIBrochurePhysiciansandHIE-WhatProvidersNeedtoKnowJan2007.pdf
4. eHealth Initiative Foundation, "Guide for Engaging Employers in Health Information Exchange Initiatives." 2007. http://toolkit.ehealthinitiative.org/assets/Documents/eHIGuideforEngagingEmployersJan2007.pdf
5. eHealth Initiative Foundation, pamphlet "Secure Electronic Health Information Exchange Guide for Consumers," 2006.
6. eHealth Initiative Foundation Media Guide. http://toolkit.ehealthinitiative.org/communication_and_outreach/media_outreach.mspx
7. eHealth Initiative Foundation Communication and Outreach tools and resources. http://toolkit.ehealthinitiative.org/communication_and_outreach/partnership_tools.mspx
8. "The State Of Regional Health Information Organizations: Current Activities And Financing", Julia Adler-Milstein, et al, *Health Affairs* 27, no. 1 (2008), Published online December 17, 2007. http://content.healthaffairs.org/
9. eHealth Initiative Foundation pamphlet "Guide for Engaging Employers in Health Information Exchange Initiatives." 2007
10. eHealth Initiative Foundation, pamphlet "Physicians and Health Information Exchange. What healthcare providers need to know." 2006
11. eHealth Initiative Foundation, pamphlet "Secure Electronic Health Information Exchange Guide for Consumers", 2006

Section 7 Domain B – Business Foundation

A. Desired Future State

The business foundation provides the fundamental starting point for the development of the economic, operational and technical models for electronic health information exchange.

In this domain you will develop the business case for designing and building a RHIO in your community. You will also develop the vision and mission of the RHIO and the value proposition to engage all stakeholders.

In order to develop the foundation, your leadership should closely examine the needs and requirements of your specific community. You should consider how to prioritize the requirements. The numbers of consumers/patients served, the severity of need or problem, or some other criteria specific to your community and/or your participants can determine prioritization.

What is the likely cost to establish and operate your RHIO? Your business foundation will consider what these costs are likely to run. It will also identify potential revenue sources, both internal and external, to fund your RHIO.

B. Why it is important

The business foundation is your RHIO's fundamental reason for being. Without a solid foundation it is impossible to describe the vision, define the mission, and create the entity. The business foundation will determine many of the other characteristics of your RHIO, not only in terms of the creation of your economic model, but also regarding the services you will offer, your technical infrastructure, education of the community, and engagement of potential healthcare participants. You should pay careful attention to this domain, particularly the creation of your vision and mission. These elements should guide each successive step of the process of forming your RHIO.

This domain is also highly interdependent with other domains such as the Technical Architecture and Economic Sustainability domains and should be closely coordinated with efforts in each of the other areas. Less obvious is the relationship between Business Foundation and Governance. Key decisions made about the Business Foundation should be taken into careful consideration when developing the appropriate Governance structure. Even a robust Business Foundation can be undone with inappropriate or ineffective Governance.

C. Activities

Purpose

The importance of the activities of this domain cannot be overstated. You should plan carefully to make sure that every fundamental question is answered during this early stage of your project. Once you have determined the specific needs and requirements of your community, you should consider how these needs might be addressed within the context of electronic health information exchange. Your discussions should include the key stakeholders within the community in order to create the necessary buy-in of the participants and supporters.

Services

Make an effort to think creatively about the types of services that might be possible via electronic health information exchange. Given the potential for error with paper records and the typical time lags in transmission of paper data there are numerous possibilities. What are the unique health challenges within your community or communities – elder care, prenatal care, access to specialists and acute care facilities? Work with your leadership team to address these needs and determine what RHIO services would be most valuable.

Business Case

When you have identified the key services your RHIO will provide, you should also consider the business case and create a list of critical success factors that will be indicators that the community's needs and requirements have been met.

Funding

Be sure to carefully consider what funding will be necessary for the start up of your RHIO. This is somewhat different from development of a business model or business plan for operations, but you should try to consider both what money will be required to get started as well as where the necessary revenues to sustain the RHIO will come from once it is operational. It may not be immediately possible to build pro forma budgets, but you should begin to estimate sizing of necessary revenue and associated expenses to operate your RHIO.

As stated earlier, remember that the overall formation process is iterative. You may find as you work through the other domains in the process that you will need to come back to your initial planning work and make adjustments. For example, once you have completed your business foundation development, you may find during the design of the technical architecture that your original assumptions regarding which services will be provided are cost prohibitive.

At that point you should come back to the Business Foundation domain and revisit your planning to determine if the services can be revised in order to be financially feasible. Or you may determine that the creation of a new RHIO may not be feasible, but that it might be possible to join an already existing group. If so, you should consult the RHITA Participation Guide, which is a companion document to the Formation Guide.

Additional activities
The following lists some of the activities that you should complete during the Business Foundation domain work. Please note these activities are not listed in sequential order. Activities in multiple areas and even multiple domains may be occurring simultaneously

- Determine the wants and the needs within the community for HIE
- Determine initial services the RHIO will provide
- Develop the business case for the RHIO
- Establish the critical success factors for your RHIO
- Identify initial funding requirements
- Establish funding plans
- Create the financial pro forma
- Determine the relative likelihood of building or joining a RHIO

D. Key Considerations

There are several key considerations involving Business Foundation to assess before moving forward. Although your Business Foundation may appear to be sufficient at a certain point in time, the process of RHIO formation may require a return to this domain to reassess it. Additionally, this allows you further opportunities to identify how to grow participation in your RHIO.

Key Considerations
• Meeting many wants and needs within your community garners more support from your stakeholders, but remember that the more services your model provides, the more complex the business and funding structure may need to be. Strive to find a realistic balance. • Your critical success factors are extremely important. You should determine what the specific outcomes would be if your RHIO is successful in enabling electronic health information exchange. What would be different if the needs and requirements were met? • Do not underestimate your funding requirements, particularly the funds necessary to get started. Be creative in the identification of potential funders. Consider approaching sponsors in addition to grant-awarding organizations and agencies. Often technology companies, pharmaceutical companies and local employers will be open to assisting with start-up funds. • Consider outside assistance to facilitate your Business Foundation discussions. A skilled objective outsider can often be invaluable in moving a group discussion toward consensus. • It may not be possible to create a funding strategy that appears to be equitable in terms of affordability. You should consider alternate approaches, including adopting models where the participating organizations use cross-subsidies between and among the various organizations taking part. One very successful model that uses this strategy is HealthBridge in Cincinnati. See http://www.hschange.org/CONTENT/970/ for an overview of the HealthBridge model.

E. Examples of Outcome Measures

RHIO leadership may be required to collect data and analyze performance over time. This is necessary to show progress as you build your RHIO. You are encouraged to collect data for several outcomes, as it will be helpful when speaking to stakeholders, consumers, members of the community and potential funders. Establish a baseline for your measures so that during the project you can show progress whenever possible.

Examples of Outcome Measures
• How clearly articulated and compelling are your vision and mission statements? When circulated within the community do they educate and/or inspire? • Do you have a prospect list for potential sponsors of your RHIO? Are they

identified as short-term and long-term opportunities, meaning the short-term list contains companies and organizations that might provide funding in the next three to six months and long-term, which contains prospects that might require twelve or more months to educate and cultivate.

- Have you met with these prospective sponsors and do you know exactly what information they will need to make a funding decision?
- What are your success factors? Do your stakeholders agree that these factors are the key measures to insure your RHIO is fulfilling its mission?
- How well does your community understand the potential benefit of HIE?
- Have you begun to consider your outreach strategy and how you will disseminate your vision, mission and the expected benefits?
- Measurement outcomes: What outcome measures will the RHIO focus on and how will they be measured? It is important that all stakeholders are able to agree on a small set of outcome measures, whether they are related to reducing cost, improving quality of care or both.

D. Reference Resources

1. eHealth Initiative Foundation, Getting Started Roadmap. http://toolkit.ehealthinitiative.org/getting_started/roadmap.mspx
2. Profile of Progress- State Health IT initiatives. http://www.nascio.org/publications/documents/NASCIO-ProfilesOfProgress2.pdf
3. eHealth Initiative Foundation Connecting for Communities Toolkit. http://toolkit.ehealthinitiative.org
4. eHealth Initiative Foundation Toolkit Value Creation and Financing. http://toolkit.ehealthinitative.org/value_creation_and_financing/
5. Colorado RHIO Business Plan. http://ehr.medigent.com/assets/collaborate/2006/03/02/eHI%20HRSA%20Funded%20Communities%20SOW_6_CORHIO%20Business%20Plan_022306_FeHI.pdf

Section 7 Domain C – Governance

A. Desired Future State

The Governance domain is where you will define expectations, roles and responsibilities, decision-making, and accountability for your RHIO. Governance is as important as your Business Foundation in ensuring the success of your RHIO. Good governance supports the vision and mission of your RHIO by making sure that the interests of your stakeholders are represented in the key policy and strategic decision making of the organization. The best governance also provides the overarching framework for operational considerations and supports the management and staff by defining clear objectives and parameters for your RHIO.

Your governance should not only reflect the composition of your stakeholders, but it should also be structured to support the business case created during the Business Foundation domain. What this means is that you should seek governing board membership from those organizations and stakeholder groups that reflect the purpose of HIE as well as those who represent the environment of your community or region and the interests of the participants.

Your Governance domain activities will obviously be closely related to the activities you undertake during the Community Leadership domain, and you will most likely find that activities of the Community Leadership, Governance and Business Foundation domains will take place in a somewhat concurrent fashion because of this close interrelationship.

B. Why it is important

Trust is the key to building and operating a successful RHIO. Transparent governance clearly defines how stakeholders will participate in and benefit from a RHIO. This is the model where the interested parties expect to have decisions explained and justified.

Today good governance provides the mechanism where expectations and objectives are defined, roles and responsibilities are determined and decision-making and accountability are distributed to the team. When you create good governance, your board will measure itself and its staff and be prepared to make adjustments as necessary.

You should be diligent to assure that your governing body is comprised of broad representation, even extending beyond the participants to the community and/or consumer/patient representation. Because the overarching goal of your RHIO is to improve clinical healthcare outcomes within a patient-centric context, having consumer representation will be important to assure that the board continues to deliver on its mission to the community.

C. Activities

Select organizational leadership

Your initial activity will be to identify and select the organizational leadership. Your leadership should be selected as much for the skills and resources as for their representation of key organizations or stakeholders. Your leaders need to understand and drive the vision for your RHIO within your community. You may wish to select some of your leadership because of their business acumen; you may select some because they are opinion and thought leaders within the healthcare field, or because they can generate funding for your enterprise. All of these qualifications are reasonable and valid criteria to use when forming a leadership body. Be careful that your leadership is balanced with regard to the groups they represent, as well as to the skill or resource they possess.

Create the mission and vision

Once your leadership has been chosen you will create the vision and establish the mission of your RHIO. (Please see Appendix A for examples) Remember that a well-articulated vision is an enrollment tool if it paints a compelling picture of a desired future state. The best vision statement is one that makes people think, “Wow, that would be terrific! How do I get involved in making that happen?” Not only will you cultivate support and participation, but you will also set the stage for your later revenue strategy if you plan on soliciting sponsorships or donations.

Develop the operating principles

The operating principles, such as “equality in quality” of care for your community or operating in a transparent manner are critically important. They are the linkage between your vision, strategic plan and the day-to-day operational decisions that will be made by staff and management. These principles should provide the parameters to ensure that your RHIO stays on course.

Determine organizational structure and governance model

Concurrently with the discussion of operating principles you should also discuss and determine what organizational structure is most appropriate. Will your RHIO operate as a joint venture, a separate 501(c)(3) corporation, or some other entity type? Will it function as a membership organization, and if so, how will directors be selected? Once you have decided on a governance model and legal structure, you can move forward with the appropriate steps to create your selected legal entity. This involves things such as articles of incorporation, joint venture agreements, membership agreements for LLC corporations, application for non-profit status to the IRS, etc.

Determine appropriate exchange model

At the same time you consider the vision and mission of your RHIO, you should determine what exchange model makes the most sense. For example, if you intend to link specialists and primary care physicians to one another and to labs or diagnostic centers, you may consider a RHIO with internet based access, such as a portal, to minimize up-front investment costs to the primary care practices

less able to afford a significant capital investment in hardware and software. You should also consider whether your model would aggregate data in a central repository or retain all data in a federated configuration with the RHIO "pulling" data from each participant in response to real-time queries.

Legal Agreements
Arizona Health-e Connection is pursuing activities and actions to build the capabilities rural RHIOs will need to address many legal issues. Arizona is helping to lead and participating in the work being done at the national level in these areas and working concurrently to determine which standards, conventions, protocols and solutions will work best in Arizona. It is expected that model business associate agreements and model consent forms will be produced as a result of this work and the Arizona RHIO's are strongly encouraged to make use of these documents. They can be found at the Arizona Health-e Connection website, www.azhec.org.

Additional activities
The following list details some of the activities that you should complete during the Governance domain work. Please note these activities are not listed in sequential order. Activities in multiple areas and even multiple domains may be occurring simultaneously

- Identify and Select the Organizational Leadership
- Create the Vision and Establish the Mission
- Develop the Operating Principles
- Determine and Approve the Governance Model
- Determine the RHIO model
- Draft and Approve the Business Associate Agreements
- Identify and Approve the Board of Directors
- Develop the Operating Policies and Procedures (See appendix B)
- Define Roles and Responsibilities
- Obtain formal legal status

D. Key Considerations

There are several key considerations involving Governance to assess before moving forward. Although Governance may appear to be sufficient at a certain point in time, the process of RHIO formation may require a return to this domain to reassess your Governance.

Key Considerations
• There are many details to consider and many activities that must be closely coordinated and conducted concurrently. Using a more formal project management approach to coordinate the details is a good idea, as is appointing a project manager to oversee and monitor progress. • Many good attempts to create RHIOs have been undermined by well intended, but poorly constituted governance. Be careful and deliberate in the selection of the individuals who will be entrusted with guiding the formation of your RHIO. They must represent not only their stakeholder group, but also the larger goals of HIE. • Reach out to other RHIOs to explore the various operating and governance models that exist. There are many variations and permutations, and one size does not fit all. • Make sure that your governing body focuses on policy first and procedure later. The main responsibility of the board is to develop policy.

E. Examples of Outcome Measures

RHIO leadership may be required to collect data and analyze performance over time. This is necessary to show progress as you build your RHIO. You are encouraged to collect data for several outcomes, as it will be helpful when speaking to stakeholders, consumers, members of the community and potential funders. Establish a baseline for your measures so that during the project you can show progress whenever possible.

Examples of Outcome Measures
• Is your board representative of all the stakeholder groups? Do they have the vision and the ability to be advocates for HIE in the community? • You should have a set of bylaws or other formal principles that detail the responsibilities of the governing body and set forth the process for the member representatives or board members to be elected, to retire and to be removed. • Your bylaws should reflect the organization's mission and support the guiding principles. • Your governing body should have specific responsibilities detailed and approved for its officers and executive management. • Your legal status should be established and approved or recognized as necessary by the federal and/or state governments.

F. Reference Resources

1. Sample Governance Structure. http://ehr.medigent.com/assets/collaborate/2005/01/03/Sample%20Organization%20and%20Governance%20Structure_01_03_05.pdf
2. eHealth Initiative Foundation Organization and Governance. http://toolkit.ehealthinitiative.org/organization_and_governance/
3. eHealth Initiative Foundation “Health Information Exchange: From Start Up to Sustainability Model”. http://toolkit.ehealthinitiative.org/value_creation_and_financing/VSMreport.mspx

Section 7 Domain D – Privacy and Security

A. Desired Future State

In your sharing of health information you must protect the data and information from exposure to accidental or inappropriate disclosure, unauthorized access, modification, removal or destruction.

B. Why it is important

Patients and consumers must have confidence that their personal health data is secure and that their privacy is protected. They deserve to know that the information will be used appropriately by whoever receives it.

The key to information sharing is reaching agreement across the participants in an HIE initiative as to the principles, policies, and procedures that each will follow in safely and securely handling the information that is to be shared
Two of the most difficult areas on which to reach consensus are privacy and security. Sometimes this is because of misunderstanding, unfounded apprehension, or specific fears; and at other times privacy and security issues are convenient to blame when other causes are at work, such as lack of trust or competitive instincts. In either case, it is critical that all parties learn about and understand the underlying principles on which trust and consensus may be built.

C. Activities

Develop privacy and security principles
You should begin by developing privacy and security principles and policies. The most confidential information is that which is secured in such a way that no one but the originator can access it. Clearly, this is an inappropriate approach in healthcare. The characteristics of confidentiality, integrity, and availability are the backbone of health information security. To support all three, security must be implemented as a careful balance of administrative, technical, and physical safeguards which are tailored to the particular information systems environment of each organization. Developing the organization's principles and policies related to the security of the data is one key to the success of a health information exchange.

Arizona Privacy and Security Initiatives

Consistent policies and standards are vital to developing local and regional health exchanges that can safely and securely transfer health information throughout Arizona. Arizona Health-e Connection, in partnership with GITA, is researching standards, proposed policies, participation agreements and other tools—the "Arizona Common Framework"—to further the development of RHIOs and other entities throughout the state. Arizona Common Framework materials reflect GITA's participation in national initiatives as well as statewide discussions and activities undertaken with AzHeC and its many constituents.

Arizona Common Framework materials currently include:

- Model Health Information Exchange Policies and Procedures
- Consumer Consent for Health Information Exchange: An Exploration of Options for Arizona's HIEs
- Executive Summary of Proposals for Statutory and Regulatory Amendments

GITA is actively involved in the national Health Information Security and Privacy Collaboration (HISPC) project and has secured funding to participate in the HISPC 2008 initiative on privacy and security issues for e-health data exchanges. As a result of this work, GITA, in conjunction with Arizona Health-e Connection, will research and refine recommended Security Policies for provider access to the HIEs in 2008.

All Arizona Common Framework documents are available at http://www.azgita.gov/ehealth/hispc. For questions, please contact Kim Snyder at 602-364-4795 or ksnyder@azgita.gov.

You must understand whether patients/consumers would be required to "opt in" or "opt out" of your RHIO's data exchange. Do patients/consumers need to affirmatively request that their data be included in the exchange (opt in); are patients/consumers automatically included in the exchange unless they make a request to be excluded (opt out)? Or will your RHIO choose some combination of these alternatives

Arizona and federal laws establish the key boundaries for the exchange of different types of health information for different purposes. In developing patient consent policies and procedures, you will want to consider similar procedures adopted by other RHIOs. Consistent consent policies can be an important element to allow information exchanges between RHIOs to reach distant patients or providers.

Reasonable safeguards must be in place to protect health information. State legislation often specifies how some information must be safeguarded and how the issue of patient consent is to be handled. You must determine what is reasonable for your community within the context of your legal environment. Patients have the right to view their personal health information. How will your RHIO address this right?

Develop privacy and security standards

You must also identify and implement privacy and security standards.
In order to efficiently assure that a patient's privacy is protected, specific privacy and security standards must be implemented consistently across all the participants in an exchange. These standards should be consistent with the standards that are being adopted at the state and national levels.

Areas where standards need to be implemented in your RHIO include:

- Authentication – Assuring that the person is who he or she claims to be
- Authorization – Assuring that the person is approved to access the data requested
- Access to Data – Assuring that information is available to persons authorized to use it and unavailable for those not authorized
- Audit of Privacy and Security Policies – Assuring that organizations and persons are complying with policies
- Use and Reuse of Data – Complying with the policies governing how data may be used or repurposed

For example, after a user claiming a given identity has been authenticated, an authorization mechanism will determine what data that user is allowed to access and what functions may be performed by the user on that data, e.g., to view, copy, or update data.

Another example is the development of policies regarding how data may be used for bio-surveillance or disease tracking. The reuse or sale of (de-identified) data must also be governed by RHIO privacy and security policies.

You should also define accountability for inappropriate behavior. Violations of privacy will result in reasonable and consistently applied penalties to deter violators. In addition, reasonable mitigation efforts should be in place to offset the effects of a breach.

Each participant in the RHIO agrees to enforce the confidentiality provisions of the RHIO by appropriately disciplining individuals within their organization who violate the confidentiality of the information as defined by each participant's respective confidentiality and disciplinary policies. Such discipline may include, but not be limited to warnings, suspensions, termination; or it may require modification, suspension, or revocation of staff privileges.

Additional Activities
The following list details some of the activities that you should complete during the Privacy and Security domain work. Please note these activities are not listed in sequential order. Activities in multiple areas and even multiple domains may be occurring simultaneously

- Develop Privacy and Security Principles and Policies
- Identify Privacy and Security Standards to be implemented
- Define Accountability for Inappropriate Behavior

D. Key Considerations

There are several key considerations involving Privacy and Security to assess before moving forward. Although Privacy and Security procedures may appear to be sufficient at a certain point in time, the process of RHIO formation may require a return to this domain to reassess your Privacy and Security procedures.

Key Considerations
• The exchange of health information must be governed by agreed upon privacy and security principles • Each participating organization must be able to show that it is complying with the established privacy and security principles • Patients have a right to know who has accessed their information • A risk assessment of the environment should be done initially • Quality assurance programs need to be in place to assure continued compliance with privacy and security principles • Each participant is responsible for insuring that its compliance practices are in place and maintained at all times

E. Examples of Outcome Measures

RHIO leadership may be required to collect data and analyze performance over time. This is necessary to show progress as you build your RHIO. You are encouraged to collect data for several outcomes, as it will be helpful when

speaking to stakeholders, consumers, members of the community and potential funders. Establish a baseline for your measures so that during the project you can show progress whenever possible.

Examples of Outcome Measures
• Privacy and Security policies written and approved • Privacy and Security standards approved • Accountability behavior and penalties defined, written, and approved

F. Reference Resources

1. Connecting for Health. http://www.connectingforhealth.com
2. eHealth Initiative Foundation, Getting Started Roadmap. http://toolkit.ehealthinitiative.org/getting_started/roadmap.mspx
3. The Common Framework. www.connectingforhealth.org/commonframework/#guide.
4. HIPAA laws. http://www.hhs.gov/healthit/privacy/
5. California RHIO Privacy and Security Implementation Plan. http://www.calrhio.org/crweb-files/docs-privacy/CA_FIPR_Report_AAv041307.pdf

Section 7 Domain E – Technical Architecture

A. Desired Future State

The Technical Architecture describes the design, technology and high level configurations of the technology platform. It includes the hardware, software, applications, networks, and standards and protocols used to connect stakeholders. These are the tools that enable them to share data and information in accordance with your RHIOs governance and operating agreements

B. Why it is important

Although actual technical implementation of the RHIO system is one of the last stages to be undertaken, the decisions about which standards you will use and which technologies you will implement should be discussed early. There are significant interactions between policy decisions (about privacy protection, for example) and the technical decisions (use of a record locator service to index distributed databases). Experience has shown that this feedback into the policy process is critical and may impact (but should not drive) policy decisions.

To implement the goal for interoperability, all participants in your RHIO initiative must agree to adhere to certain technical standards at a level of detail not often found today.

C. Activities

Understand the planned capabilities for the RHIO
Begin by understanding the capabilities your RHIO will provide as determined in the business foundation. The technical architecture that is implemented must enable the capabilities that your RHIO organization has agreed upon. How organizations agree to share data and where it is stored drive the technology decisions for the types of database implemented. For example, if the participating organizations require that they maintain control over all the data they generate, that would rule out the establishment of a central data base for the exchange.

Determine technology standards
You must also determine appropriate technology standards which should consist of at least a minimal set of commonly adhered to standards and policies that allow for interoperability between participating organizations. For example, there are many types of Web standards (SSL, XML 1.0, and SOAP 1.1), clinical messaging standards (HL7 2.3, 2.4, 2.5, 3.0, etc) and encryption protocols. You must determine the suite of standards that is right for your exchange.

Design and exchange architecture
You will also need to design an exchange architecture. There are several types of exchange models that a RHIO can be based upon. These include:

- Centralized model – where the data from all the participants is stored in a central location.
- Distributed or federated model – where the data is stored only at its point of origin and copies of the data are sent to authorized requesters
- Hybrid model – where some subset of the data – usually demographic and some clinical data is stored centrally. The rest of the data remains with the original source and is available upon request.

The type of model that is right for your RHIO will be greatly influenced by the capabilities desired and the data sharing agreements that are developed in the Business Foundation and Governance domains. For example, some participants may not want to give up control of their data to a central organization so this may point towards a distributed model of data sharing. Some exchanges may require that a minimum amount of data be stored centrally for quick access, but other data remains with the source of the data. This would lend itself more towards a hybrid model of exchange.

Decide upon key technical components
You also need to understand and decide upon a number of other architecture components:

Record Locator Service (RLS)
The RLS is responsible for knowing where to locate the records that are requested by your authorized participants. An RLS generally has two main functions: it accepts updates to patient record locations; and it accepts queries for the location of patient records and returns record locations when it finds matches. You will need some form of RLS regardless of the type of exchange model you choose.

Master Person Index (MPI)
The MPI is the technology that uniquely associates a patient with his or her records. Typically this is done through sophisticated matching algorithms that determine a probability that the record is correctly associated with a given patient.

It is important that you determine the level of surety that your provider community will tolerate. Generally potential matches that are less than 100% are presented for human review. If there are too many “doubtful” matches, providers may quickly learn not to trust the system. It is just as important or maybe more important that records that do not belong to a patient are not presented as “positively” belonging to that person as it is to assure that all the records for a patient have been presented. Presenting a record as belonging to a patient when in fact it does not, is referred to as “false positive.” Determining that a record does not belong to a particular patient when it does

is referred to as “false negative.” Too high a level of either of these instances will cause serious trust issues for your exchange.

Aggregating records
There are several ways to aggregate the records that are retrieved as a result of an inquiry into the system. Depending on the type of exchange model that has been chosen, the range of how much aggregation occurs and where it occurs can vary greatly. Some exchanges will aggregate of all of the information retrieved as a result of a query and send it as one package to the requestor. Others in a distributed model will send each record that is located individually to the requestor.

Displaying records
Once the records are located, retrieved, and aggregated, they must be displayed to be useful. Just as data aggregation can be accomplished in a variety of ways, so can the display of the data. The retrieved and aggregated data may be displayed directly by the exchange through a clinical portal. The data may be integrated into an existing electronic health record (EHR) system, input into a decision support tool, or made available for use through some other electronic means.

Conduct a proof of concept
In the formation phase you should plan to conduct a proof of concept which includes the running of at least a rudimentary technical platform. The purpose of this endeavor is not to fully implement your technical solution, but to assess the robustness of the policies and procedures that have been developed for data sharing among the various entities involved.

Additional Activities
The following list details some of the activities that you should complete during the Technical Architecture domain work. Please note these activities are not listed in sequential order. Activities in multiple areas and even multiple domains may be occurring simultaneously.

- Understand the Capabilities that the RHIO will provide
- Determine Appropriate Technology Standards
- Research technical options
- Design Technical Architecture
- Select technology (late in formation phase)
- Conduct pilot of proof of concept tests
- Identify staffing requirements to support the architecture (late formation)
- Determining pricing of the technical architecture (late formation)

D. Key Considerations

There are several key considerations involving your Technical Architecture to assess before moving forward. Although Technical Architecture may appear to be sufficient at a certain point in time, the process of RHIO formation may require a return to this domain to reassess your Technical Architecture. Additionally, this allows you further opportunities to identify how to grow your participation.

Key Considerations
• The technical architecture should be determined by the capabilities that the business plan required. • Some legacy systems may not be able to readily share information. A full technical assessment of prospective participants is a necessary first step. • Privacy and security policies should be supported by the technical architecture • The choice of a vendor solution should be left to late in the formation stage

E. Examples of Outcome Measures

RHIO leadership may be required to collect data and analyze performance over time. This is necessary to show progress as you build your RHIO. You are encouraged to collect data for several outcomes, as it will be helpful when speaking to stakeholders, consumers, members of the community and potential funders. Establish a baseline for your measures so that during the project you can show progress whenever possible.

Examples of Outcome Measures
• Technical requirements based upon business needs have been approved • Technical standards are documented and approved • Technical architecture designed and approved Outcomes below will not be completed until late in your formation efforts. These outcomes generally are achieved after a solid business, governance, and privacy and security foundation is established. • Record locator service technology selected • Master Person Index technology selected • Proof of concept of technical architecture successfully completed

F. Reference Resources

1. eHealth Initiative Foundation, Getting Started Roadmap. http://toolkit.ehealthinitiative.org/getting_started/roadmap.mspx
2. The Common Framework. www.connectingforhealth.org/commonframework/#guide.
3. eHealth Initiative Foundation Technology Principles. http://toolkit.ehealthinitiative.org/technology/common_principles.mspx
4. Health Information Technology Interoperability Standards Panel, 2007. http://www.ansi.org/standards_activities/standards_boards_panels/hisb/hitsp.aspx?menuid=3
5. Certification Commission for Healthcare Information Technology. http://www.cchit.org/

Section 7 Domain F – Community Outreach

A. Desired Future State

Ultimately, you want to have broad community support for your RHIO. Community outreach is about engaging additional stakeholders, legislative and political representatives, additional consumers/patients, and potential users of your RHIO services in support of your RHIO's mission and vision.

B. Why it is important

It is important that during the formation stage you lay a solid foundation of community support. Outreach is important because it builds the groundwork of support you will need to grow your organization. Broad support for your RHIO will become increasingly important as your effort matures. Your goal is to build sufficient trust and involvement among RHIO providers, consumers/patients and your community to enable the RHIO to adequately serve the healthcare needs of its medical trading area.

C. Activities

In your initial business planning, you should have considered the logical growth path for your RHIO. You will have already identified which of your potential stakeholders joined in your RHIO formation efforts. Once you have a basic RHIO formation plan it is time to begin involving more of the community. Consider which stakeholders are key to expanding your support.

Tell your story
Begin your effort by telling your story to your community. People want to know what you are doing, what services you will provide, and how they will benefit from using your RHIO. You should tell your story so that everyone hearing it can directly identify with the value your RHIO will provide to them.

Construct a framework that clearly describes the value proposition for each stakeholder group and describe, in concrete terms, the benefits they each receive. Describe your current stakeholders and the direct benefits they plan to receive. You can use this information to help tell your story.

Build a marketing and communications plan
Based on your identification of the value proposition of your existing and potential stakeholders, you can create a marketing and communications plan. The purpose of this plan is to focus your community outreach efforts towards your targeted stakeholders. The marketing and communications plan will create the key messages you want to convey to your potential stakeholders including the

value they can expect to receive from your RHIO. The plan should be targeted towards a variety of audiences.

As a key element in your marketing and communications plan, you will need to develop a set of critical success factors or outcome measures to determine if your plan has the desired impact. Outcome measures focus on the results rather than the effort. If your stated goal is to build community support, how will you know that support exists and at what level? Outcome measures will help you determine your impact in achieving your goal of building community support. Examples of outcome measures can be found in section E below.

Create your marketing materials
The next step is to design and create your marketing materials. Your plan will identify all of your targeted audiences including the general public, patients, providers, and other key stakeholders. You will need to determine the best way of reaching each of them and then design your materials, building on your key message points that will appeal to each group.

Once you have completed your marketing and communications plan, it is time to launch your efforts and implement your plan. The plan will clearly outline specific tasks and actions for your RHIO to take to create forward momentum. The plan will also outline who has specific responsibility for each task and/or action detailed in the plan.

Track the effectiveness of your plan
Tracking and reporting on the overall effectiveness of the plan is critical to your success. No plan is ever perfect and yours will need adjustments as you implement various parts of the plan. You will gain valuable knowledge of what works and why and you can use this information to provide you with valuable feedback. Based on this information you can modify your approach and your materials to increase the plan's overall effectiveness. In addition to the feedback, continual and transparent reporting is critical to developing trust in your community. Where you are at any point in time should be clear to any interested observer. Without community trust, it will be difficult to gain community support.

Refine your materials
Finally, you will need to refine your communications and marketing materials to reflect the changing environment. All environments change over time and you will need to stay ahead of these changing conditions for maximum effectiveness. It is frequently the case that an excellent plan is thought to be good indefinitely and never reviewed and modified. This is seldom true. Consistent monitoring and updating will be a critical element in your overall success.

Additional activities
The following list details some of the activities that you should complete during the Community Outreach domain work. Please note these activities are not listed in sequential order. Activities in multiple areas and even multiple domains may be occurring simultaneously.

- Identify various types of constituent target audiences
- Create key messages based on the unique value proposition for each target audience
- Conduct local focus groups to test and refine key message points and to gather additional data and information
- Develop the communication and marketing plan
- Design the marketing materials
- Determine the outcome measures for the marketing efforts
- Implement the communications and marketing plan
- Track and report on the overall effectiveness of the campaign
- Refine the communications and marketing materials to reflect the changing environment

D. Key Considerations

There are several key considerations involving Community Outreach to assess before moving forward. Although Community Outreach may appear to be sufficient at a certain point in time, the process of RHIO formation may require a return to this domain to reassess your Community Outreach.

Key Considerations
• Community trust is the most important factor in the expansion of your RHIO. Gaining and keeping trust is dependent upon openness and transparency. • Once trust is achieved, it can be maintained by transparency and openness. • Remember, it is impossible to over-communicate when doing community outreach. You will need to continue telling your story because there will always be someone who hasn't heard it yet. • Keep your current supporters informed and engaged.

E. Examples of outcome measures

RHIO leadership may be required to collect data and analyze performance over time. This is necessary to prove progress as a result of the efforts to provide better healthcare to your community. You are encouraged to collect data for several outcomes, as it will be helpful when speaking to stakeholders,

consumers, members of the community and potential funders. Establish a baseline for your measures to show increases whenever possible.

Examples of Outcome Measures
• Meeting targeted goals for the expansion of your original stakeholder group. • Increasing community awareness and positive perceptions of your RHIO. • Changes over time in community perceptions of your RHIO

F. Reference Sources

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2. eHealth Initiative Foundation, pamphlet "Physicians and Health Information Exchange. What healthcare providers need to know" 2006. http://toolkit.ehealthinitiative.org/assets/Documents/eHIBrochurePhysiciansandHIE-WhatProvidersNeedtoKnowJan2007.pdf

3. eHealth Initiative Foundation, "Guide for Engaging Employers in Health Information Exchange Initiatives." 2007. http://toolkit.ehealthinitiative.org/assets/Documents/eHIGuideforEngagingEmployersJan2007.pdf

4. eHealth Initiative Foundation, pamphlet "Secure Electronic Health Information Exchange Guide for Consumers," 2006.

5. eHealth Initiative Foundation Media Guide. http://toolkit.ehealthinitiative.org/communication_and_outreach/media_outreach.mspx

6. eHealth Initiative Foundation Communication and Outreach tools and resources. http://toolkit.ehealthinitiative.org/communication_and_outreach/partnership_tools.mspx

7. Small Business Administration Marketing Information. http://www.sba.gov/smallbusinessplanner/manage/marketandprice/SERV_MARKBASICS.html
8. http://www.sba.gov/smallbusinessplanner/manage/marketandpriceSERV_TARGETMARKETING.HTML

Section 7 Domain G – Economic Sustainability

A. Desired Future State

Economic sustainability is the state of the RHIO that can be maintained at a satisfactory financial and operational level indefinitely. Annual revenues exceed annual expenses and your RHIO has a sufficient return to fund its ongoing capital and operating costs including funded depreciation. In addition, you have developed a business model where you can fund your expansion requirements in accordance with your strategic plan.

B. Why it is important

Attaining financial sustainability and operational independence is critical to attracting and retaining stakeholders and your continued operation. Your RHIO should operate within a financial model that, at a minimum, has an annual positive net margin and sources of investment capital for future growth. Stakeholders will be attracted to your RHIO if they can see measurable financial strength and improved healthcare in their community. This will provide for the growth of HIE and will ultimately lead to better and less costly healthcare.

C. Activities

When you built the business foundation for your RHIO, you considered several alternative methods for funding your RHIO. You investigated various revenue models and considered various options. You examined several methods of raising your required investment capital. You developed a financial plan for obtaining the required funds to support your ongoing operations. You have now reached a point where you have tested your ability to exchange data and information. You have priced out your technical infrastructure and understand your staffing requirements. Now you have to convert all of this information into long-term economic sustainability model.

Ideally, all of the stakeholders in your RHIO have been informed about all of the activities you have done to date so there should not be any surprises. All of the stakeholders should be acutely aware of your ongoing financial situation and have been involved with the architecture of the exchange and all of its attributes. Your task is to now convert this accumulated knowledge into action.

Test your business plan assumptions
Your first activity is to test your accumulated knowledge with your original business plan. Given all the assumptions you made initially, how close are you to your projections? Where are there shortfalls and where did you exceed expectations? It is particularly important to note these gaps because it will directly impact your sustainability model.

Four key elements are important to consider.

- First, are your revenue projections sound and sustainable?
- Second, are your expense projections reasonable and can you provide the promised level of service within these expense restrictions?
- Third, can you hire and retain the quality of staff you need to operate the RHIO within the expense projections?
- Finally, can you fund your ongoing capital requirements and expansion plans within the net profit margin? If the answer to each of the questions is positive, you are ready to begin building your sustainability model.

Secure agreement on the revenue model

Once you have determined you have a viable business model for moving forward, you need to secure agreement with all of the stakeholders concerning the approved revenue model. Remember, initially the stakeholders also built assumptions regarding their own potential costs savings, enhanced services, additional revenues, and other reasons they may have had for joining. They may or may not be able to meet their obligations to your RHIO if their assumptions proved incorrect. Therefore, you must make sure they are committed to the revenues you projected in your model. Commitment in the form of a written agreement and/or contract is the best way to ensure your revenue projections are valid.

Secure start-up funding

The next step is to secure the start-up funding. With the stakeholder agreements in place, your RHIO is in a position to move forward and secure its initial funding. There are many sources of initial funding. Which one your RHIO chooses may be dependent on your overall financial model. For example, if the return on investment is high and the pay-back period relatively short, the stakeholders may choose to provide the necessary start-up funding. If the opposite is true, your RHIO may need to seek funding from other sources including government and/or foundation grants. Bank loans and venture capital are possibilities as well.

Additional activities

The following lists some of the activities that you should complete during the Economic Sustainability domain work. Please note these activities are not listed in sequential order. Activities in multiple areas and even multiple domains may be occurring simultaneously.

- Test your accumulated knowledge to your original business plan
- Determine if your plan business model is sustainable over time
- Identify what adjustments may be required to create a long-term, sustainable model
- Secure final agreements/contracts with all of your stakeholders committing them to your RHIO
- Identify and secure your funding

D. Key Considerations

There are several key considerations involving Economic Sustainability to assess before moving forward. Although Economic Sustainability may appear to be sufficient at a certain point in time, the process of RHIO formation may require a return to this domain to reassess your Economic Sustainability.

Key Considerations
• Test the assumptions you made early in the formation phase. Remember that things change. • Are your key stakeholders committed for the long-term? Do you have those agreements in writing? • Where are you getting your financing? How reliable of a source is it?

E. Examples of outcome measures

RHIO leadership may be required to collect data and analyze performance over time. This is necessary to show progress as you build your RHIO. You are encouraged to collect data for several outcomes, as it will be helpful when speaking to stakeholders, consumers, members of the community and potential funders. Establish a baseline for your measures so that during the project you can show progress whenever possible.

Examples of Outcome Measures
• Sufficient stakeholders in your RHIO to build a sustainable business • Conformance to your business plan • Agreements signed by stakeholders • Sufficient and secured funding to operate your RHIO

F. Reference Sources

1. Agency for Healthcare Research and Quality Evidence Report/Technology Assessment Number 132. Cost Benefits of HIT. http://www.ahrq.gov/downloads/pub/evidence/pdf/hitsyscosts/hitsys.pdf
2. Healthcare Information and Management Systems Society (HIMSS) Healthcare Information Technology and Return on Investments. http://himss.org/ASP/topics_FocusDynamic.asp?faid=167
3. Patient Safety Institute. Economic Value of a Community Clinical Information Sharing Network. http://www.ptsafety.org/resources/PSI_cost_savings.pdf

4. RHIO Wiki ROI tag. http://www.socialtext.net/rhiowiki/index.cgi?roi
5. American Health Information Management Association Foundation of Education and Research (AHIMA/FORE). Report and Recommendations on Health Information Exchange Services that are Financially Sustainable. http://www.hhs.gov/healthit/documents/AHICBinder20071023.pdf
6. "The State Of Regional Health Information Organizations: Current Activities And Financing", Julia Adler-Milstein, et al, Health Affairs 27, no. 1 (2008), Published online December 17, 2007. http://content.healthaffairs.org/

Section 7 Domain H Education

A. Desired Future State

Education provides the teaching and learning of specific skills, competencies, knowledge, and wisdom about the processes, tools and techniques for a successful transition to HIE. All of your stakeholders, in order to participate in your RHIO, will need to adapt new processes, procedures, and systems.

B. Why it is important

Educating and training stakeholders on how these new processes, procedures and systems directly benefit them and how they will use them is essential to a smooth transformation. In the end, all of the RHIO stakeholders need to fully understand and operate according to the processes, procedures, protocols, and systems designed for the successful operation of your RHIO.

C. Activities

Activities in this domain must be carefully planned during the RHIO formation phase. The initial result of this activity is a training plan and it will describe what needs to be taught, who will develop and deliver the content, and to whom the education will be delivered. Even though this is part of the formation stage, the activities will be implemented as part of your transition from formation to an operational RHIO. In other words, these activities will occur late in the formation stage, but must be considered throughout your planning.

Business process training for RHIO
As with any new business, you will be developing operational processes to meet the requirements of your business plan. In order to ensure training and education are available to your staff members, you will need to document your processes so education and training materials are developed and can be implemented as you transition to an operational phase.

Process training for participants
External training and education is also a requirement. Many of your stakeholders will look to the RHIO to provide a minimum level of initial training and education for their internal staffs. Your stakeholders will want and need you to train their staff members on RHIO systems, processes and procedures. Be prepared to work closely with your stakeholders. Interact with them to make sure they are aware of the training you provide. Help them gauge the ability of their staffs to learn and absorb the new information.

Technical training
In your previous work, you will have determined the systems, processes and procedures you will employ to operate your RHIO. Education on many of the technical systems should be a component of the vendor delivery process. Hardware and software vendors usually provide some minimum level of education and training on their systems when they are purchased.

Additional activities
The following list details some of the activities that you should complete during the Education domain work. Please note these activities are not listed in sequential order. Activities in multiple areas and even multiple domains may be occurring simultaneously.

- Determine your hardware and software, training and education requirements
- Develop your internal training and education materials for your own operating systems, processes and procedures
- Provide initial and ongoing training and education to all the stakeholders so everyone is following the same operational processes and procedures

D. Key Considerations

There are several key considerations involving Education to assess before moving forward. Although Education may appear to be sufficient at a certain point in time, the process of RHIO formation may require a return to this domain to reassess your Education.

Key Considerations
• When purchasing hardware and software, you will need to understand the level of training required and the level of training purchased. Frequently, the level of training purchased is not sufficient to ensure a smooth transition for all of the RHIO staff. Because the RHIO has multiple stakeholders with a variety of staff skills, you will want to ensure adequate training and education as well as ongoing support is purchased. • Remember to include education on your processes and procedures as well as the technology. • How many of the key stakeholders are fully committed to educating their staffs? Broad education on the systems, processes, and procedures are critical to making the RHIO successful. • Having the stakeholders assist with the building of the education plan and curriculum will help ensure their general buy-in to the need for staff education.

E. Examples of outcome measures

RHIO leadership may be required to collect data and analyze performance over time. This is necessary to show progress as you build your RHIO. You are encouraged to collect data for several outcomes, as it will be helpful when speaking to stakeholders, consumers, members of the community and potential funders. Establish a baseline for your measures so that during the project you can show progress whenever possible.

Examples of Outcome Measures
• Training plan developed • Meeting targeted goals in the number of stakeholder staff members attending the RHIO education sessions • Adequate funding from the RHIO Board of directors to provide sufficient training and education • Operational error rate due to lack of training below your established threshold

F. Reference Sources

1. Profile of Progress- State Health IT initiatives. http://www.nascio.org/publications/documents/NASCIO-ProfilesOfProgress2.pdf
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6. eHealth Initiative Foundation Communication and Outreach tools and resources. http://toolkit.ehealthinitiative.org/communication_and_outreach/partnership_tools.mspx

7. eHealth Initiative Foundation New State Legislation Tracking Center. http://ccbh.ehealthinitiative.org/communities/community.aspx?Section=288
8. State RHIO Consensus Project. http://www.staterhio.org/

Section 7 Domain I Practice Transformation

A. Desired Future State

Practice transformation is the alignment of the processes, procedures, and systems of a particular practice to the operational processes, procedures and systems of the RHIO. This is the step that allows the practice to exchange patient data and information between itself and other accredited HIE entities. Participants use commonly accepted systems processes, and procedures that allow the RHIO to improve healthcare and lower overall costs within its medical trading area. In addition, common systems are critical to the long-term success your RHIO and in gaining long-term economic sustainability.

B. Why it is important

Participation in a RHIO requires a high degree of commonality in processes, procedures, and systems to enable the exchange of data and information between entities. Integration of systems, processes, and standard protocols between each practice and the RHIO are essential for efficient HIE. This does not imply that each entity has to use the same hardware and software applications. The issues described earlier in this guide related to governance, business foundation, privacy and security, economic sustainability, and education need to be resolved and agreed upon prior to full practice transformation.

It is also important to use a fully developed change management process to help with the transformation. A robust change management system should include:

- Your Leadership – You have to change you first
- Your Vision – Create a compelling case for others to join you
- Your Commitment – Be prepared to stay the course
- Some Risk – Nothing changes until something changes
- Competent Resources – Get the right people on the bus with you
- Outside assistance – Follow a proven process through change

C. Activities

Activities in this domain must be carefully planned during the RHIO formation phase. The initial result of this activity is a practice transformation plan and it will describe what needs to be done to assure that each practice can optimize the services that your RHIO will provide. Even though this is part of the formation stage, the activities will be implemented as part of your transition from formation

to operational RHIO. In other words, these activities will occur late in the formation stage, but must be considered throughout your planning.

Enlist physician leaders
One great place to begin your practice transformation effort is to identify and enlist any physicians in your community who are leaders in HIE and can act as RHIO champions. Nearly every community has physicians who may have already converted to an electronic records system or are in the process of converting. Many of the younger medical school graduates are already technically savvy and are possible candidates for leading the practice transformation effort for your RHIO. Getting a group of champions together and having them work within their peer community is an ideal way to make significant progress.

Analyze current workflows
Start any practice transformation by analyzing your current work flows. Your analysis will provide a benchmark for measuring progress over time and give you the information required to determine where service improvements occur and how large your return on investment has been. In addition, a good analysis will cause inefficiencies to surface and clearly show where opportunities for improvement exist.

Describe the future state of the practice
The next step in the process is to identify and describe the desired future state. Your RHIO will be able to provide this because of all the previous work accomplished. You should be able to provide a clear vision of the future and describe in detail what the practice will look like when the transformation is complete. The desired future state will include all of those processes, procedures and systems adopted by your RHIO.

Develop practice transformation plan
When the practice has a clear picture of the future and understands your processes, procedures and systems, they will be in position to draft a transformation plan. The transformation plan consists of two key parts. First, the plan includes a description of what actions need to be taken to achieve alignment with the RHIO. Second, the plan contains a description of the new behaviors each employee of the practice needs to adopt for success. In other words, the first part describes what will be different and the second part describes how you and your stakeholder practices will work together with the new processes, procedures, and systems.

Transformation plans will provide the timeline for various activities related to the adoption of the RHIO processes, procedures, and systems. The plans will identify who is to complete what activity. The plans will also identify the sequence for completing various activities and outline the key milestones to determine if the practices are making progress at the right pace.

The role of the RHIO in practice transformation is to provide three key support activities for the practice.

Assist with conversion to Electronic Medical Records (EMR)
First, your RHIO can provide assistance with the conversion process. You will have developed the business case for EMR and HIE adoption as well as the experience necessary to help practices transform their operations as a result of all the work you have done prior to this point.

Help develop the business case for RHIO participation
Second, your RHIO will be able to clearly describe the business case and the return on investment for most practices. As a result, you will be in a position to help the practices secure any financing required for them to join your RHIO.

Create a peer group for information exchange
Finally, you can bring together various practices and create a peer group to exchange transformation experiences and connect practices with similar hardware and software applications so they can resolve common problems.

Additional activities
The following list details some of the activities that you should complete during the Practice Transformation domain work. Please note these activities are not listed in sequential order. Activities in multiple areas and even multiple domains may be occurring simultaneously.

- Identify the physician HIE champions within the community
- Assist the providers as they analyze their office workflows and use a reliable transformation process to initiate change
- Assist the providers with the implementation and adoption of new processes that enable them to optimize the benefits of HIE
- Evaluate incentive and financing programs
- Develop the business case for EMR and HIE adoption
- Provide a prominent platform for the physician champion to tell the success story

D. Key Considerations

There are several key considerations involving Practice Transformation to assess before moving forward. Although Practice Transformation may appear to be sufficient at a certain point in time, the process of RHIO formation may require a return to this domain to reassess your Practice Transformation. Additionally, this allows you further opportunities to identify how to grow your participation.

Key Considerations
• Practice transformation is a change management project. It is not about learning new technologies; it is about learning a new way of working. Therefore, following a proven process to change staff behaviors is the key to success. • Learning a new technology while also learning a new way of operating and behaving in the workplace, is difficult for most people. It is important to give them the time they need to adapt to new ideas. • People tend to respond to challenges if they know someone else has been successful at the same challenge. Share the success stories identified during your community outreach work early and often with the staff at the various practices to help them prepare for the transformation process. • Adults generally need permission to learn something new. It is important that as the practices are transitioning to a new processes that they continue to feel and be perceived as competent.

E. Examples of outcome measures

RHIO leadership may be required to collect data and analyze performance over time. This is necessary to show progress as you build your RHIO. You are encouraged to collect data for several outcomes, as it will be helpful when speaking to stakeholders, consumers, members of the community and potential funders. Establish a baseline for your measures so that during the project you can show progress whenever possible.

Examples of Outcome Measures
• Completing the transformation process at each practice according to an agreed upon schedule • Transforming an agreed upon number of practices as outlined in your business plan to ensure the long-term success of your RHIO. • X number of identified RHIO champions are working to make the transformation successful • All RHIO systems, processes and procedures are in place and operational

F. Reference Sources

1. eHealth Initiative Foundation Practice Transformation and tools. http://toolkit.ehealthinitiative.org/practice_transformation/default.mspx

2. eHealth Initiative Foundation Practice Transformation resource document.

http://toolkit.ehealthinitiative.org/practice_transformation/tools.mspx?Section=382&Category=396&Document=960

3. eHealth Initiative Foundation Resources for Value Creation and Financing. http://toolkit.ehealthinitiative.org/value_creation_and_financing/resources.mspx

Section 8 – Summary

Developing a RHIO is a journey. It is not something that can or should be undertaken lightly or with minimal planning. It involves a significant amount of knowledge and effort. This guide was developed to provide you with the knowledge gained by those who have been down this road ahead of you.

We have discussed the nine domains you need to address in detail.
The domains are:

A. Community Leadership
   The recognition by a critical mass of healthcare provider leaders that a RHIO has value and should be pursued for the betterment of the community

B. Business Foundation
   The business case for designing and building a RHIO in your community including the vision and mission of the RHIO and the value proposition to engage your stakeholders

C. Governance
   The process of defining expectations, roles and responsibilities, decision-making, and accountability for the RHIO

D. Privacy and Security
   The protocols selected to protect data and information from exposure to accidental or inappropriate disclosure, unauthorized access, modification, removal or destruction, and/or unreasonable interference with individual rights to protection of information

E. Technical Architecture
   The hardware, software, applications, networks, and standards and protocols selected to connect stakeholders that enable them to share data and information in accordance with RHIO governance and operating agreements

F. Community Outreach
   The engagement of stakeholders, legislative representatives, consumers, and users of RHIO services in support of its mission, vision, growth and development

G. Economic Sustainability
   The state of the RHIO that can be maintained at a satisfactory financial and operational level indefinitely

H. Education
   The teaching and learning of specific skills, imparting knowledge, and developing wisdom about the processes, tools and techniques for a successful transition to a RHIO

I. Practice Transformation
The art of aligning processes, procedures, and systems of a particular practice to the operational processes, procedures and systems of the RHIO

Within each of these domains there are a series of activities which you need to include in your plans. At times you will need to perform actions within multiple domains concurrently to achieve a satisfactory result. Other times you will need to revisit decisions made earlier in your work due to gaining new insights and information.

By understanding your community and following these planning steps you will be in a good position to develop a successful RHIO in your community.

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APPENDIX A

Example Vision and Mission Statements of RHIOs

Below you will find examples of vision and mission statements from various RHIO efforts around the United States. It should be noted that each of these RHIOs is an evolving entity and the most current versions of their vision and mission statements can be found at their respective web sites. The respective URLs are included for your convenience.

CALIFORNIA,
California Regional Health Information Organization (CalRHIO)

CalRHIO is a statewide community of healthcare providers and payers, government, and consumer organizations committed to the secure exchange of information and investment in information technology.

Mission
CalRHIO is a collaborative statewide initiative in California whose mission is to improve the safety, quality, and efficiency of healthcare through the use of information technology and the secure exchange of health information.

Vision
Healthcare that is safe, of high quality, and efficient, in an information-rich environment and that meets the needs of consumers, patients, providers and others in California's communities.

http://www.calrhio.org

COLORADO
Colorado Regional Health Information Organization (CORHIO)

The CORHIO Initiative is a statewide coalition of interested individuals, healthcare providers, agencies, organizations and community leaders collaborating to build a statewide electronic health information network and launch a new type of nonprofit entity – a regional health information organization or RHIO. The Colorado RHIO will be part of a nationwide network of similar organizations linked through common standards and purposes to oversee operations for a virtual National Health Information Network.

Mission
Advance implementation of a statewide interoperable electronic health information network by providing leadership to facilitate stakeholder decision-making.

Vision
Colorado will have a statewide electronic health information infrastructure to optimize the health and healthcare of Colorado residents.

http://www.corhio.org/

FLORIDA,
Florida Health Information Network (FHIN)

Groups of stakeholders interested in developing health information exchange have formed organizations called RHIOs representing many healthcare stakeholders including providers, employers, insurers, community groups, public health officials, and State Universities. Although in the initial phases of development, three RHIOs (Big Bend RHIO, Palm Beach Community Health Care Alliance, and Tampa Bay RHIO) are currently operating networks.

Mission

- Advise the Governor and Agency for Healthcare Administration on the development of the Florida Health Information Network (FHIN)
- Identify obstacles to the implementation of FHIN and provide policy recommendations to remove or minimize those obstacles
- Assist in ensuring the privacy and security of personal health information on the network.

Vision

A comprehensive integrated network of health privacy-protected record systems among the state's healthcare stakeholders capable of providing medical information at the point of care, whenever and wherever that may be; computerized "decision support" programs – built-in clinical logic that automatically analyzes all available health information to assist providers in making sound clinical decisions based on current medical science; and state-of-the-art public health functionality to permit real-time outbreak monitoring and disease reporting.

http://ahca.myflorida.com/dhit/index.shtml

FLORIDA,
Tampa Bay Regional Health Information Organization (TBRHIO)

TBRHIO is a community based, public/private partnership committed to the development of a regional health information network. The TBRHIO's vision is to use the internet to make health records available to doctors and patients at the time and place such information is needed.

Mission and Vision- Long Term

- To improve the quality of care and cost efficiency of healthcare delivery through an effective system of health information exchange.
- The development of a comprehensive health information network for the Tampa Bay area and the entire State of Florida – an infrastructure of interoperable health record systems connecting the state's healthcare community – providers, payors, public health officers and researchers.

INDIANA
Indiana Health Information Exchange (IHIE)

IHIE was formed by a unique collaboration of Indiana healthcare institutions to help improve patient safety and efficiency. The Indiana Health Information Exchange (IHIE) is a non-profit venture backed by a unique collaboration of Indiana healthcare institutions

Vision
To use information technology and shared clinical information to:

- Improve the quality, safety, and efficiency of healthcare in the state of Indiana,
- Create unparalleled research capabilities for health researchers,
- Exhibit a successful model of health information exchange for the rest of the country.

http://www.ihie.org

MICHIGAN & INDIANA
Michiana Health Information Network (MHIN)

MHIN was founded in 1998 and encompasses northern Indiana and southwestern Michigan. MHIN is dedicated to providing secure, single source access to patient clinical information. Current offerings include a data repository, messenger service and an integrated EHR.

Vision
A comprehensive single source of data delivered.

http://www.mhin.net/web_news/index.asp

MINNESOTA
Minnesota e-Health (MN E-health)

MN e-Health Initiative is a public-private collaborative guided by a statewide advisory committee with 26 representatives from interested and affected stakeholders in health information technology (HIT).

Vision
To accelerate the adoption and use of health information technology to improve healthcare quality, increase patient safety, reduce healthcare costs and enable individuals and communities to make the best possible health decisions.

http://www.health.state.mn.us/e-health

NEW YORK
Bronx Regional Health Information Organization (Bronx RHIO)

Bronx RHIO is sponsored by Bronx-based healthcare providers — hospitals, community primary care centers, Federally Qualified Health Centers, nursing homes, home health agencies, and the NYC Department of Health and Mental Hygiene. Together they provide most of the care received by the 1.4 million residents of the Bronx.

Vision
To enhance public health reporting and surveillance and to greatly strengthen the system's ability to identify, quantify, localize and respond to emerging disease outbreaks, and other threats to the public's health.

http://www.montefiore.org/whoweare/stories/bronxrhio/

NEW YORK
Healthcare Information X-change (HIXNY)

HIXNY is a unique collaboration between healthcare organizations serving hospitals, physicians, insurance companies, employers and patients. Originally organized in 1999, the initial efforts of HIXNY involved evaluation of a community web portal for electronic claims transactions and organization of a workgroup of hospitals and health plans to develop mutually agreed upon regional HIPAA transaction standards.

Mission
HIXNY's dual mission is to reduce healthcare costs and promote high quality clinical care by providing a technology infrastructure and services to enable physicians, hospitals and other healthcare providers and insurers to interact, share information resources, and conduct business using a standardized, HIPAA compliant approach to administrative transactions.

http://www.hixny.com/proj_tf_min.htm

NEW YORK
TACONIC Health Information Network and Community (THINC)
Independent Practice Association (IPA)

The Taconic IPA is involved in an information technology project to improve the quality, safety and efficiency of healthcare in the region. Over the past three years, the organization has worked with area hospitals and laboratories to create a community wide electronic data exchange. Currently, the Taconic IPA is in the midst of implementing a full electronic health record in some practices and e-prescribing in other practices. The purpose is to study the impact of an electronic health record on safety and quality measures.

Mission
To provide the premier healthcare delivery network in the greater Hudson Valley, optimizing the value of medical services while maximizing physician satisfaction.

http://www.taconicipa.com/

OHIO
Health Bridge

HealthBridge is a not-for-profit health information exchange serving in the Greater Cincinnati tri-state area. Founded in 1997, HealthBridge is one of the nation's largest and most successful community health information exchanges.

Mission

To improve the quality and efficiency of healthcare in our community by serving as a trusted third party working with all participating healthcare stakeholders to facilitate creation of an integrated and interoperable community healthcare system.

http://www.healthbridge.org/index.php

TENNESSEE & VIRGINIA
CareSpark

CareSpark is an innovative effort underway in the central Appalachian region that is working to improve health through the collaborative use of health information. The region includes 17 counties in the Tri-Cities Tennessee and Virginia area with approximately 705,000 residents, 18 hospitals, and 1,200 physicians.

Mission
To improve the health of people in our region through the collaborative use of health information and thereby encourage patients and health professionals to be better informed and more engaged in decisions affecting personal health and wellness.

http://www.carespark.com/

UTAH
Utah Health Information Network (UHIN)

UHIN is a broad-based coalition of Utah healthcare insurers, providers, and other interested parties, including State government. UHIN is a consensus-based coalition. UHIN members have come together for the common goal of reducing healthcare costs for themselves through the use of Electronic Data Interchange (EDI).

Mission
To provide the consumer of healthcare services with reduced costs, improved healthcare quality and access, and to facilitate research by:

- Creating and managing an electronic value-added network to link the healthcare community participants in the State of Utah for the purpose of interchanging important financial and clinical information.
- Standardizing healthcare transactions and healthcare reporting, electronic interface development and communications services.
- Gathering and providing data to a statewide data repository.
- Conducting educational programs consistent with the purposes for which the Corporation was organized.
- Providing charitable services which lessen the burden of government by providing data to help state agencies fulfill their responsibilities as legislatively mandated.

http://www.uhin.com/

WASHINGTON
Inland Northwest Health Services (INHS)

We represent an approach to healthcare that is unlike any other in the world; overseeing several collaborative services that work on behalf of the region's major competing hospitals. We develop new solutions through unprecedented partnerships and innovative technologies – bringing safer, more cost-effective and higher quality care to Spokane, the Inland Northwest, and potentially the nation.

Mission
On behalf of our sponsoring healthcare systems, we provide unique, affordable, services using collaborative and innovative approaches for the benefit of the entire healthcare continuum. These local regional and national solutions improve efficiencies and health outcomes in rehabilitation and clinical services, critical care transportation, information technology, healthcare education and other healthcare services, and incorporate the highest ideals from the sponsoring health systems' joint Christian heritage in the provision of medical care.

Vision
INHS, on behalf of its sponsoring health systems, Empire Health and Providence Services of Eastern Washington, seeks to be a recognized national leader in innovative and collaborative healthcare solutions.

http://www.inhs.info/default.aspx

APPENDIX B

Governance Principles, Operating Policies, and Procedures Resources

1. Central Florida RHIO=Organizing Principles - http://ccbh.ehealthinitiative.org/communities/states.aspx?Location=Florida&Record=265

2. RHIO Governance Series, Part I: A Road Map for Establishing Your Health Information Organization http://www.dwt.com/practc/hit/bulletins/02-05_RHIOGovernance.htm

3. Connecting for Health : The Common Framework Overview & Principles-Policies for Information Sharing http://www.connectingforhealth.org/commonframework/docs/Overview.pdf http://www.connectingforhealth.org/resources/20071107_slide_ispolicies.pdf

4. "Getting Information Rights Right…" and " Writing the RHIO fine print" AHIMA http://library.ahima.org/xpedio/groups/public/documents/ahima/bok1_032269.hcsp?dDocName=bok1_032269 http://library.ahima.org/xpedio/groups/public/documents/ahima/bok1_030769.hcsp?dDocName=bok1_030769

5. Bronx RHIO P & P and Governance Documents http://www.bronxrhio.org/downloads/BronxRHIO_PoliciesAndProcedures.pdf http://www.bronxrhio.org/about/docs.php

6. New York Health Information Security and Privacy Collaboration-Standardized Consumer Consent P & P for RHIOs in NY State. http://www.health.state.ny.us/technology/nyhispc/phase_ii/docs/standardized_consumer_consent_policies_and_procedures_for_rhios.pdf

7. (Guiding Principles) eHealth Care Quality and Patient Safety Board Information Exchange Workgroup http://ehealthboard.dhfs.wisconsin.gov/workgroups/information/ie-report2006-11-01.pdf

8. CareSpark Board of Directors Resolutions http://www.carespark.com/index.php?option=com_content&task=view&id=57&Itemid=59

9. CalRHIO Governance Documents http://www.calrhio.org/?cridx=503

APPENDIX C

Terms and Acronyms

- **HIT - Health Information Technology** is a local deployment of technology to support organizational business and clinical requirements. HIT is technology implemented within the physical space of a doctor's office, laboratory, and hospital or virtually through a hospital system. Items such as electronic medical records (EMR) systems, administrative systems (such as billing), and workflow systems are examples of HIT systems
- **HIE - Health Information Exchange** is infrastructure to enable the exchange of health related information between organizations. Services are built once and used multiple times by many. Items such as a central Web site, healthcare terminology translation tools, a master patient index (MPI), authentication and authorization infrastructure, and applications to aggregate information from multiple sources are examples of HIE resources.
- **RHIO - Regional Health Information Organization** is an organization that brings together healthcare stakeholders within a defined geographic area and governs the electronic exchange of health-related information among them for the purpose of improving health and care. Activities such as community leadership, business planning, governance, privacy and security, community outreach and practice transformation are examples of RHIO related work.

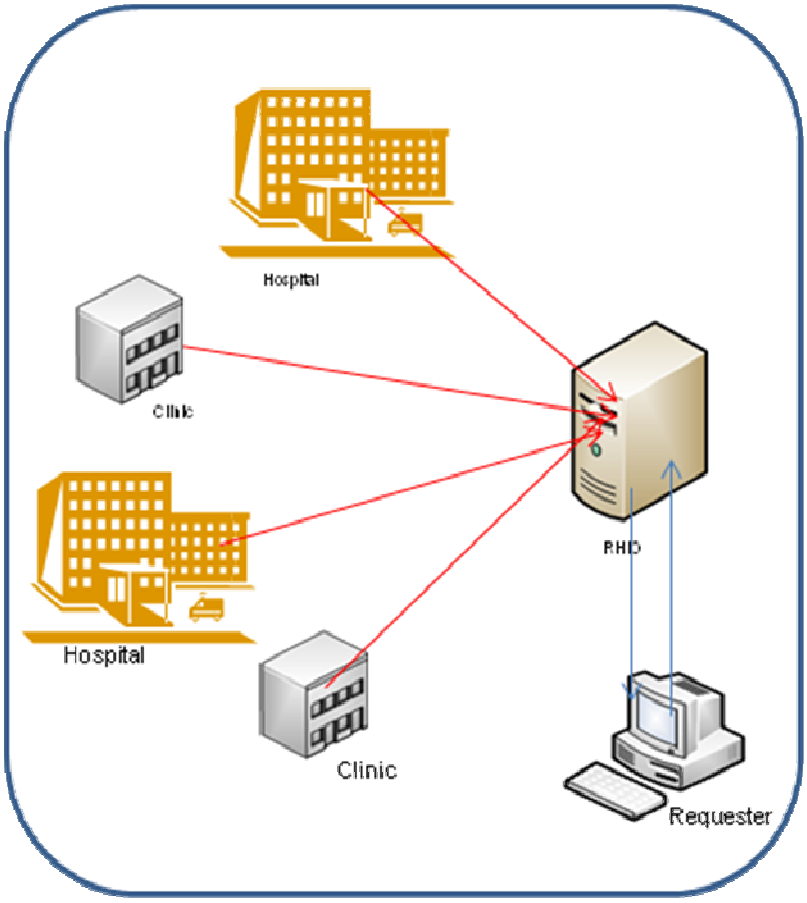
Acronyms

- **EMR – Electronic Medical Record**
- **EHR – Electronic Health Record**
- **GITA – Government Information Technology Agency**
- **HISPC – Health Information Security and Privacy Collaboration**
- **MPI – Master Person Index**
- **ONC – Office of the National Coordinator for Health Information Technology**
- **RHITA – Rural Health Information Technology Adoption Grant Program**
- **RLS – Record Locator Service**
- **SAHIE - Southern Arizona Health Information Exchange**

APPENDIX D

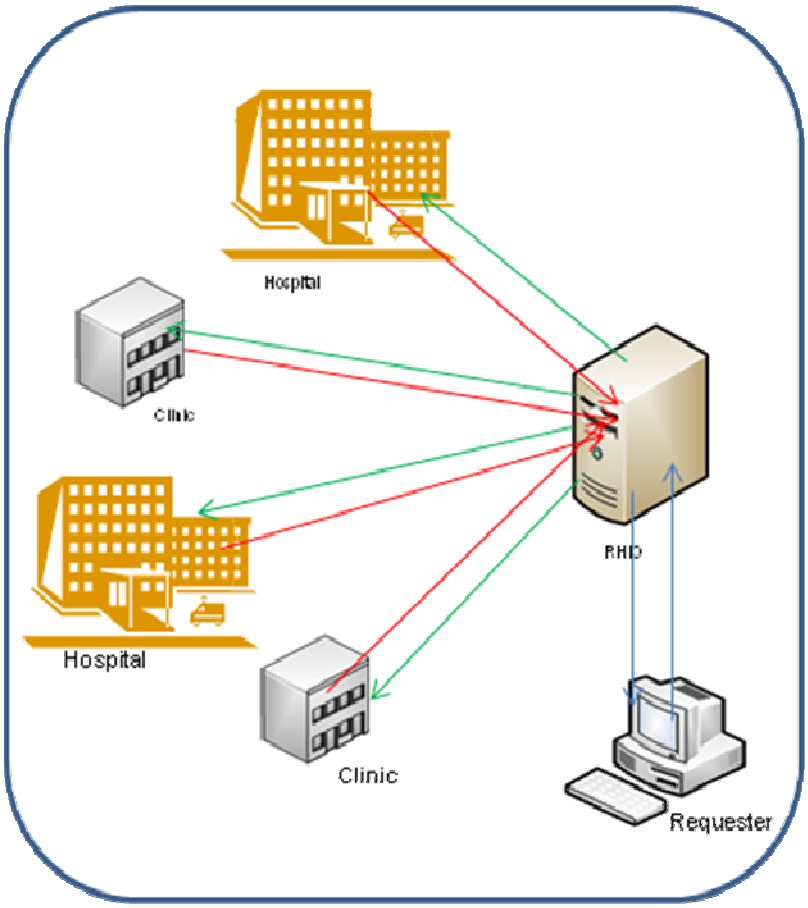
Examples of Technical Architectures

Figure 3 – Centralized Architecture



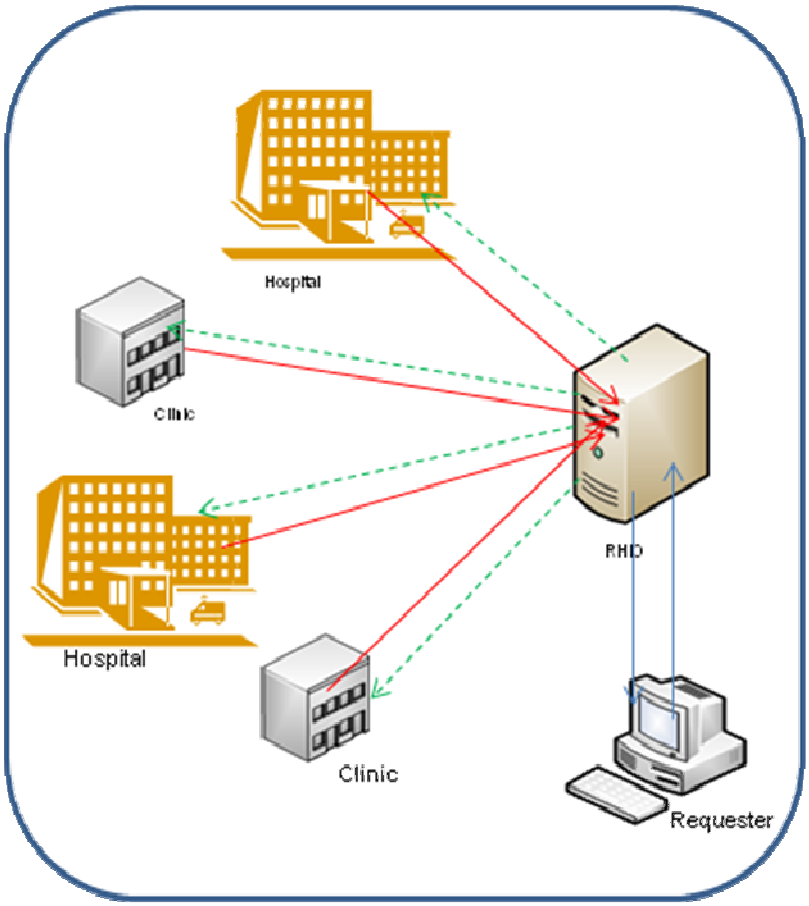
A typical centralized architecture is implemented as a single large database that aggregates similar data from numerous sources in one location. Because all data exists in a single warehouse, it is very easy and fast to perform queries against it.

Figure 4 – Distributed Architecture



In a distributed architecture the actual data is not replicated to the central database. Instead, only small portions of the data are replicated - enough to adequately identify the unique patient. In addition to these few elements, there are also pointers to where the actual data is housed.

Figure 5 – Hybrid Architecture



In a hybrid architecture only some of the actual data is replicated to the central database. In addition to the required data to identify the patient, the central database may store a minimum of clinical data. This is commonly referred to as a "minimum clinical data set" and may include such information as current medications, current diagnoses, and allergies. In addition to these few elements, there are also pointers to where additional data is housed.

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