



MEDIT 235 Capstone Project

Redstone Valley Hospital HIE Proposal

Team 3

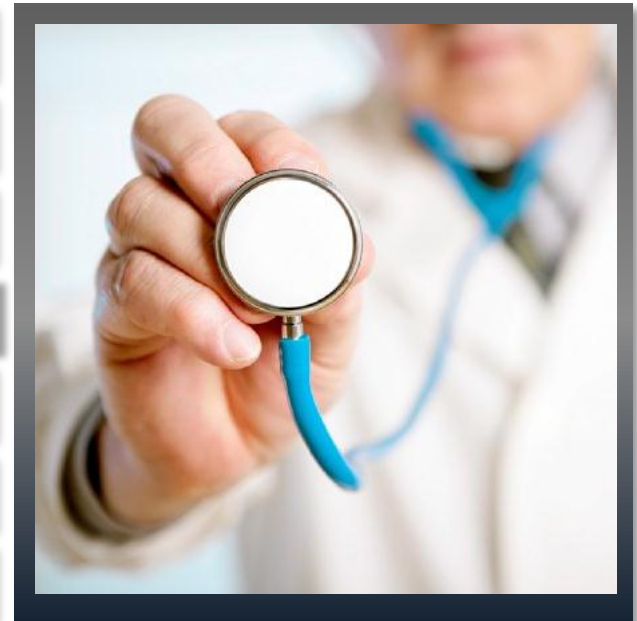
David McKanna

Bob Morgan

Arleen Nomura

Redstone Valley Hospital HIE Proposal

- 1 Redstone HIE Proposal Summary
- 2 What is an HIE, why build one?
- 3 Benefits and Obstacles to HIEs
- 4 Redstone HIE Recommendation**
- 5 Technical Infrastructure to Support HIE
- 6 HIE Implementation
- 7 Proposal Summary



Introduction

Redstone Valley Hospital – HIE Proposal

- Proposal to the Redstone Valley Hospital (Redstone), which is based in a region where an HIE is not yet operational
- Redstone is the largest and leading care facility in an area with:
 - Over 100 ambulatory clinics
 - 5 smaller community hospitals, AND numerous, Specialty Clinics, Pharmacies, Labs, Imaging Services, Nursing Homes, etc.
- This proposal gives recommendations for:
 - Why Redstone should initiate an HIE
 - The most appropriate HIE business model, infrastructure, and implementation plan



 **Redstone Valley Hospital**

What is an HIE?

A “switchboard for patient-centered care”

There were 73 operational HIEs last year (up 28% over 2009)

eHealth Initiative's 2010 Survey of HIEs

Reduced Cost

- **Elimination of unnecessary and redundant tests and services**
- Reduction in the number of unnecessary hospital admissions
- Better and more regular use of generic substitutes for prescriptions

Improved Quality and Safety

- **Access patient information for any facility where assessment, diagnosis, or treatment occurred**
- Facilitates monitoring and avoidance of drug side effects, and drug-drug interactions
- Facilitates disease mgmt as information can be tracked, analyzed, to identify trends

Increased Patient Satisfaction

- **Virtually instant access to medical history at any participating care facility in the HIE**
- More efficiencies and continuity of care
- Support for more complete records in Personal Health Records (PHRs)

What is the value of the HIE?

70-80% of patient care happens outside the hospital

- HIMSS11 "Secret to Success: Facilitating Real HIE Among Disparate Organizations" Dr. Richard Lang, CIO Doylestown Hospital in PA
 - HIE includes 100,000 patients & ~1,000,000 data imports
 - MSFT Health Users Group 2010 award, Best Use of HIE
- **Key Takeaways:**
 - Without visibility into outside interactions (clinics, specialty care, nursing homes) a hospital cannot effectively deliver safe, high quality patient care
 - Value of an HIE is directly related to the number of participating hospitals and clinics (Metcalf's Law, fax machine example)
 - Getting large numbers of clinics to join an HIE early in the deployment is key to the HIEs success and the value (and ROI) to the hospital



Obstacles to HIEs

According to the 2010 National eHealth Collaborative

Securing buy-in
from all interested
stakeholders

- Developing trust needed to share sensitive data
- Challenge of smaller clinics often lacking the dedicated IT resources to manage integration issues

Lack of
interconnecting
technology
(standards)

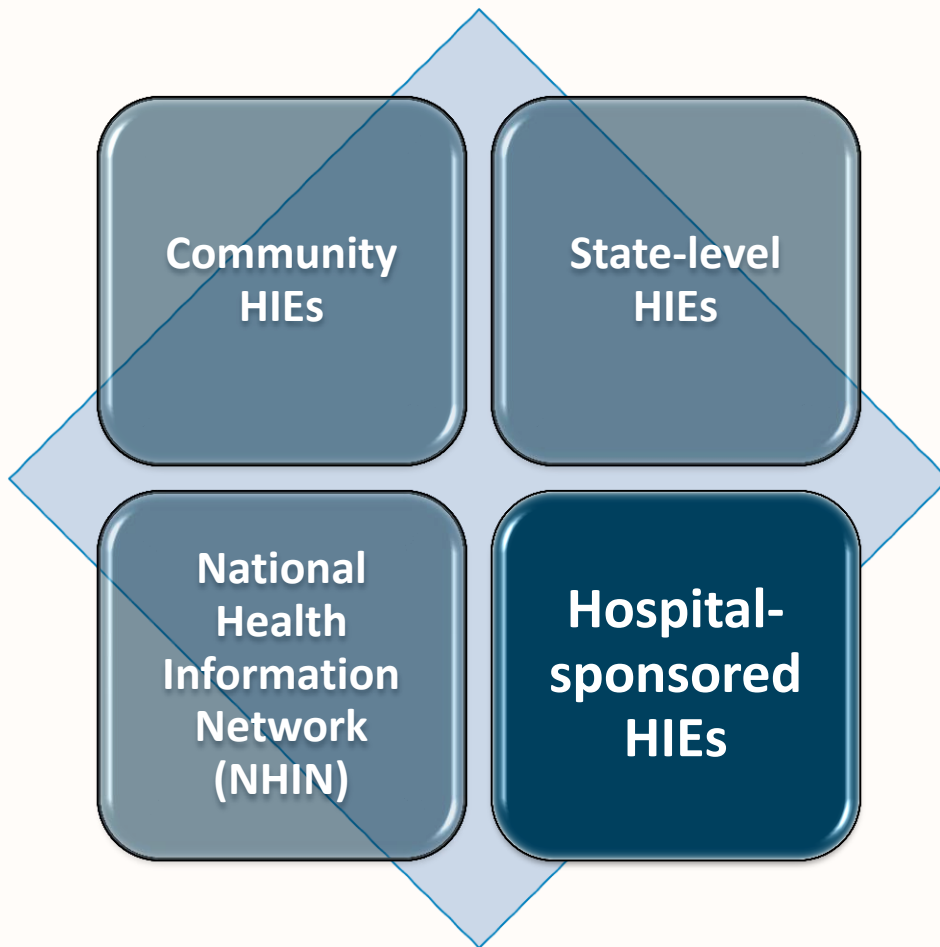
- Individual EMR/EHR vendors aren't in alignment with industry standards
- Need for a working and reliable Enterprise Master Patient Index (EMPI)

Financial viability
and long term HIE
sustainability

- How best to allocate HIE cost to each hospital or clinic
- Varying needs, expectations, and revenue models of potential HIE participants

HIE Models

NIHN, State, Community, Hospital-Sponsored



- “A larger market is developing for “Enterprise” HIEs”
- “Enterprises are seeking to establish tighter relationships with affiliated practices to drive new business, and improve quality and efficiency in preparation of payment reform”

HIE Market Report: Analysis & Trends,
Chilmark Research, Jan 2011

<http://chilmarkresearch.com/available-reports/>

Recommendation

Redstone Valley Sponsored HIE

- Proposing that the Redstone take the initiative to set up a “hospital sponsored HIE” using IBM’s Initiate and the dbMotion Solution platform
 - All HIE members will benefit from reduced costs, increased quality, and improved productivity
 - Clinics will see value in Redstone’s technical leadership and accelerated adoption of EHR use
 - Redstone benefits from increased referrals through participating HIE clinics
 - Can be built in phases and designed to motivate clinic participation with shared costs over time



Success Story

UMass Memorial Health Care system

- Webinar in Health Data Management Magazine
 - “Strategic Value of HIE at Umass Medical Health Care”
- dbMotion button added to Allscripts and Siemens Soarien screens
 - Provides view to patient information outside Umass
 - Community Master Patient Index provides comprehensive (trusted) patient record for use by any HIE member
- Connectivity provided through SaaS based IBM Initiate
 - Simplifies implementation with smaller clinics
 - Handles all required data mapping and maintenance

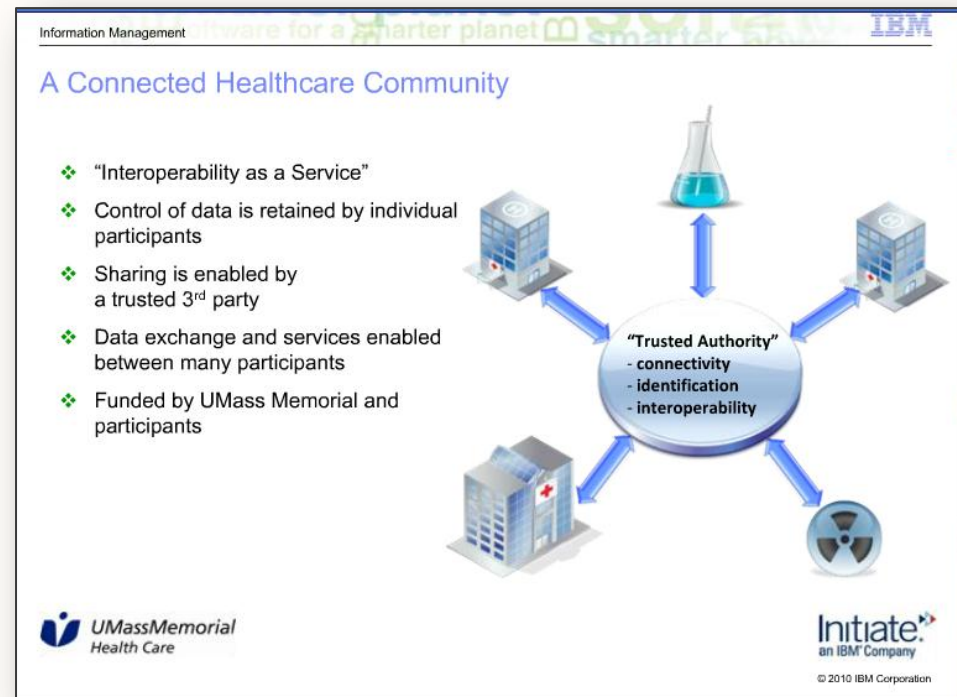


Success Story

UMass Memorial Health Care system

Umass HIE model addresses major challenges to adoption and sustainability

- Easy adoption (buy-in) through smaller clinics with SaaS platform
- Facilitates trust with distributed data ownership through Community MPI
- Sustainable, as participants will pay for the services they are using, and IBM and dbMotion are capturing recurring revenue for services

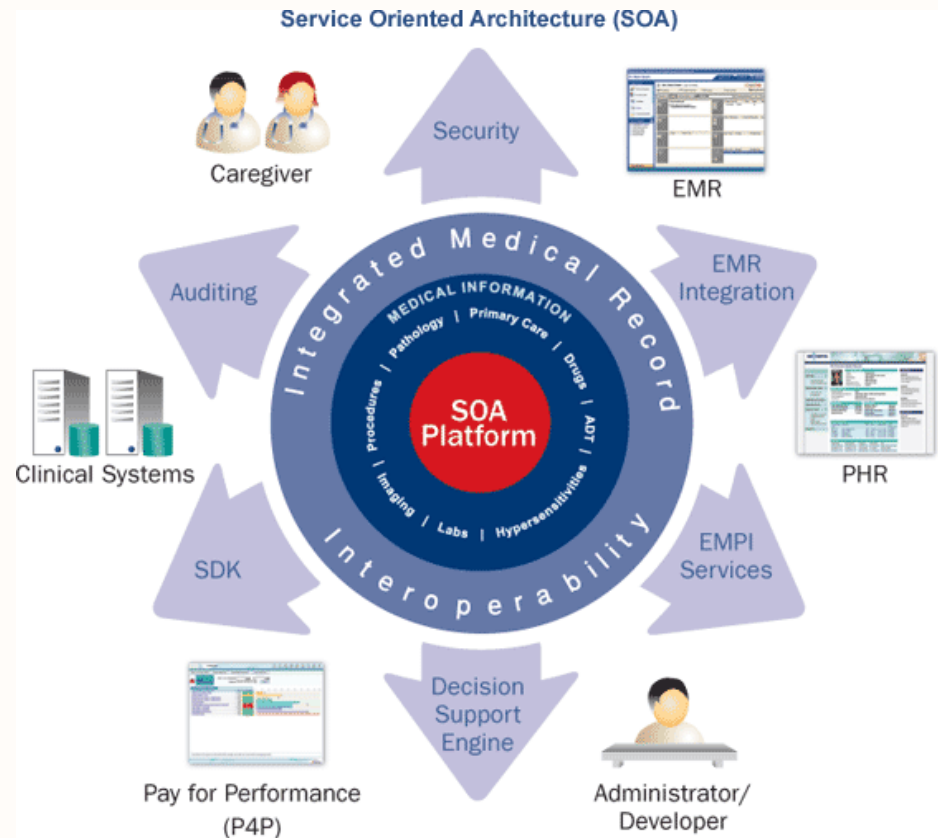


Technical Overview

Redstone Valley Hospital HIE



- Recommending dbMotion, based on Service Oriented Architecture (SOA)
 - Initially offering ADT (Admit, Discharge, and Transfer), Lab, and Radiology data services
 - Data translation and mapping is done under dbMotion



HIE Connectivity

- Connectivity is achieved via IBM Initiate Exchange
 - Initiate Exchange is a SaaS-based connectivity and integration solution
- Broadband Internet access required
- Secure Messaging
 - Achieved through SSL VPN or HTTPS
- Authentication is done via passwords and PINs (personal identification numbers).



dbMotion "button"

Name: Maria Surname: Green Gender: Female Age: 67 Other: 09/22/2008

Note

Pat Loc: Status:

dbMotion

Follow-up: Status: Needs Input

Reason For Visit
Chief Complaint
History of Present Illness
Diabetes Type II, Follow Up
Review of Systems
Extended Female ROS
Active Problems
Current Meds
Allergies
Vitals
Physical Exam

Physical Exam

Constitutional (Brief) ☒ Brief ☐ Comprehensive All Normal Previous Exam

Constitutional (E.M. One bullet for measurement of 3 vital signs; one bullet for general appearance.)

☒ Alert ☒ Well Nourished ☐ Healthy Appearing
☒ No Acute Distress ☒ Well Developed ☐ Normal Voice/Communication

Eyes (Brief) ☒ Brief ☐ Comprehensive All Normal Previous Exam

Eyes

☒ Normal Sclera/Conjunctiva ☒ BOM ☐ Normal Optic Discs
☒ BSR/LA ☐ No Strabismus ☐ Normal Retina

ENT (Brief) ☒ Brief ☐ Comprehensive All Normal Previous Exam

ENT

☒ Normal Outer Ear/Nose ☒ Normal Hearing ☒ Normal Lips/Orals
☒ Normal Throat ☒ Normal Nasal Mucosa/Septum ☒ Normal Oropharynx

Neck (Brief) ☒ Brief ☐ Comprehensive All Normal Previous Exam

Neck

☒ Normal Appearance ☒ No Neck Mass ☒ Thyroid Not Enlarged
☐ Supple ☒ No JVD ☒ No Thyroid Nodules

Constitutional: no fever and no chills.
Cardiovascular: no chest pain and no palpitations.
Respiratory: no shortness of breath, no wheezing and no cough.
Gastrointestinal: no abdominal pain, no vomiting and no diarrhea.
Genitourinary: no dysuria and no unexplained vaginal bleeding.
Integumentary: no skin lesions and no unusual growth on the skin.

View Recompile Sign EM Copy Forward Security Codes Audit Save & Close Save Cancel

dbMotion Application

dbMotion Demo Dr. Mark Spark Cardiologist Logout

Cardiology Specialists

Patient Details: Name: Maria Green Age: 67 Gender: Female Advanced Directive

Encounters Demographics Procedures Allergies Diagnoses Medications Tests/Labs Labs Summary Quick views Documents Immunizations Codes/Alert Views

Summary Admissions: Diagnoses: Hypersensitivities: Show

Regular Medications:

Demographics * Last 3 allergies

Father's Name	Christopher Larsen
Date of Birth	22/04/1942
Next of Kin	Nancy Green
Address	3010 N Alafaya Trail
Home Phone	(407) 232-4441
Primary Clinic	City Center Clinic

Allergies

Allergy
Penicillin
Latex
Erythromycin

Admissions * Last 4 admissions

Date	Admitting Department	Facility	Discharge
2007/05/16	Emergency	Lillian Medical Center	
2009/02/23	General Surgery	Med Hospital	
1993/07/07	Orthopedics	Rafael Hospital	

Medications * Last 10 medications

Prescription Date	Medicine	Sig	Amount
2008/12/24	Actonel 35 mg oral tab	1 PO weekly	#90
2008/12/24	Prinivil 10 mg oral tab	1 PO bid	#90
2008/12/24	Bayer Children's aspirin	1 PO daily	
2008/12/24	Actos 30 mg oral tab	1 PO daily	#90
2008/06/16	Lipitor 20 mg oral tab	1 PO daily	#90
2008/05/19	Metoprolol 50 mg oral tab	1 PO daily	#30
2004/12/04	Metformin 1000 mg oral tab		#180

Diagnoses * Last 4 diagnoses

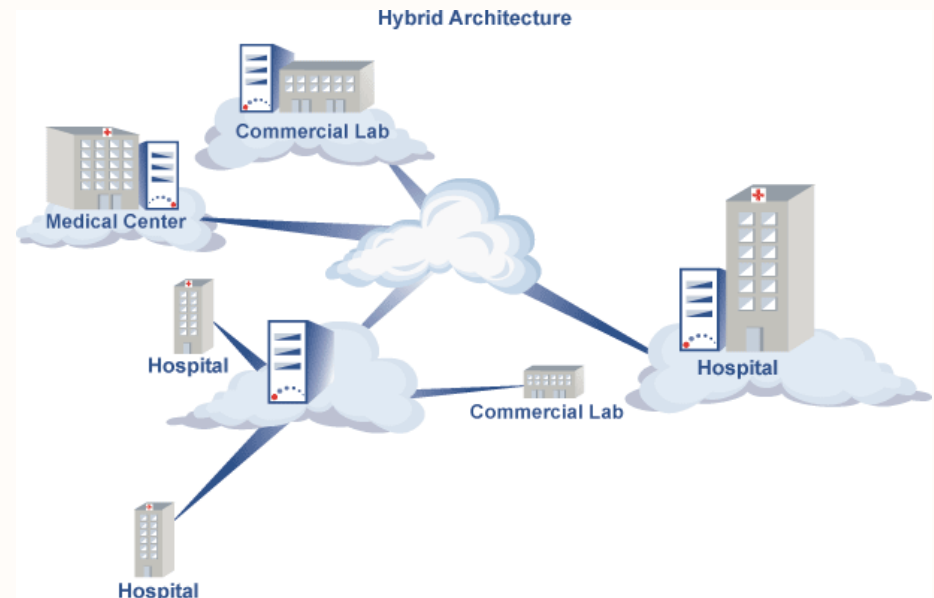
Date	Diagnosis	Facility
2008/12/24	Osteoporosis	City Center Clinic
2008/12/24	Hypertension	City Center Clinic
2008/12/24	Hyperlipidemia	City Center Clinic
2008/12/24	Diabetes Mellitus Type 2	City Center Clinic

dbMotion

Architecture (Data Exchange)

Four models: Bank, Central, Federated, Hybrid

- **Hybrid Model:** combines a centralized and a federated configuration
 - Patient records are identified by a combination of regional and local identifiers
 - The central record is typically demographics and some clinical data while detailed data is accessed via record locators to authorized requestors



Directories

EMPI, CMEI, RLS

Enterprise Master Patient Index (EMPI), IBM Initiate Patient

- Supports the HL7 v2 and v3 profiles above as well as Audit Trail and Node Authentication (ATNA)
- ATNA requires only local user authentication and bi-directional certificate-based node authentication for connections between nodes
- Audit trails provide a way to detect non-compliance with security policies

Community Master Entity Index (CMEI)

- Identifies providers and their associated organizations
- Handles multiple organizations or locations per provider and multiple hierarchies for relationships between entities, such as provider to patient.

Record Locator Service (RLS)

- AKA Document Registry
- Maintains metadata about each registered document in a document entry and responds to queries
- RLS conforms to the IHE XDS.b standard.

Data Repository

dbMotion Clinical Data Repository

- dbMotion's **Clinical Data Repository (CDR)** is a persistent database tasked with the management and storage of patient information
 - CDR complies with Cross-Enterprise Document Share (IHE XDS.b) and Cross-Enterprise Document Sharing for Imaging (XDS-I.b) standards
 - Each contributor controls security and privacy rules such as consent, data sharing and authorization
 - dbMotion presents a single interface regardless of the original document format, location and collection process



HIE Data Sets

Phase 1

Admission, Discharge and Transfer (ADT) Notices

- Alert caregivers that a patient has moved to another location
- Useful to family members accessing a PHR or to insurers monitoring high cost days and transitions of care

Lab results

- Reports of lab values and testing standards, including requests for results
- It is not orders for tests

Radiology

- Refers to images and reports of imaging results even though the two have different delivery needs (HL7 and DICOM)

HIE Data Sets

Phase 2

Encounter/Episode	• Documents chart content such as diagnostic or treatment info
Orders	• Request for something to be approved or a service to be provided
Discharge summary	• Transition Plan (includes problem list, medication reconciliation, etc.)
Immunizations	• History of a patient's immunizations (A Federal requirement in 2011)
Allergies & Problem Lists	• Summary and separate from the Encounter/Episode data set
Eligibility & Benefits	• X12 transaction set re: coverage & benefit for a service or procedure
Unstructured Messages	• Allow for exchange of non-standard messages (secure email)

HIE Implementation Plan

Designed over 3 Phases



Implementation phases are preceded by 6 month planning period to form teams, set up internal structures, agreements, etc.

Pilot /Phase 1 (12 months):

HIE “pilot” phase to install and test initial HIE functionality with 1 or 2 clinics, and Phase 1 bringing on additional clinics

Phase 2 (12 months):

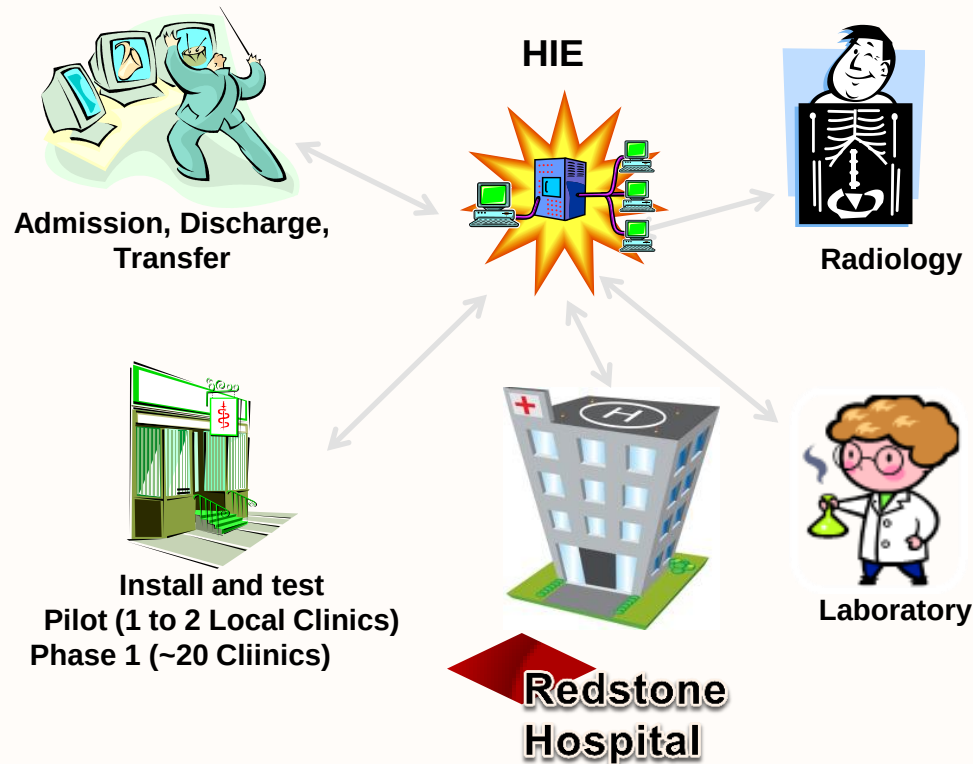
Adds new functionality with a focus on recruiting a large percentage of clinics to the HIE

Phase 3 (12 months):

Adds functionality, invites area hospitals, sets stage for connection to other HIE's (NHIN)

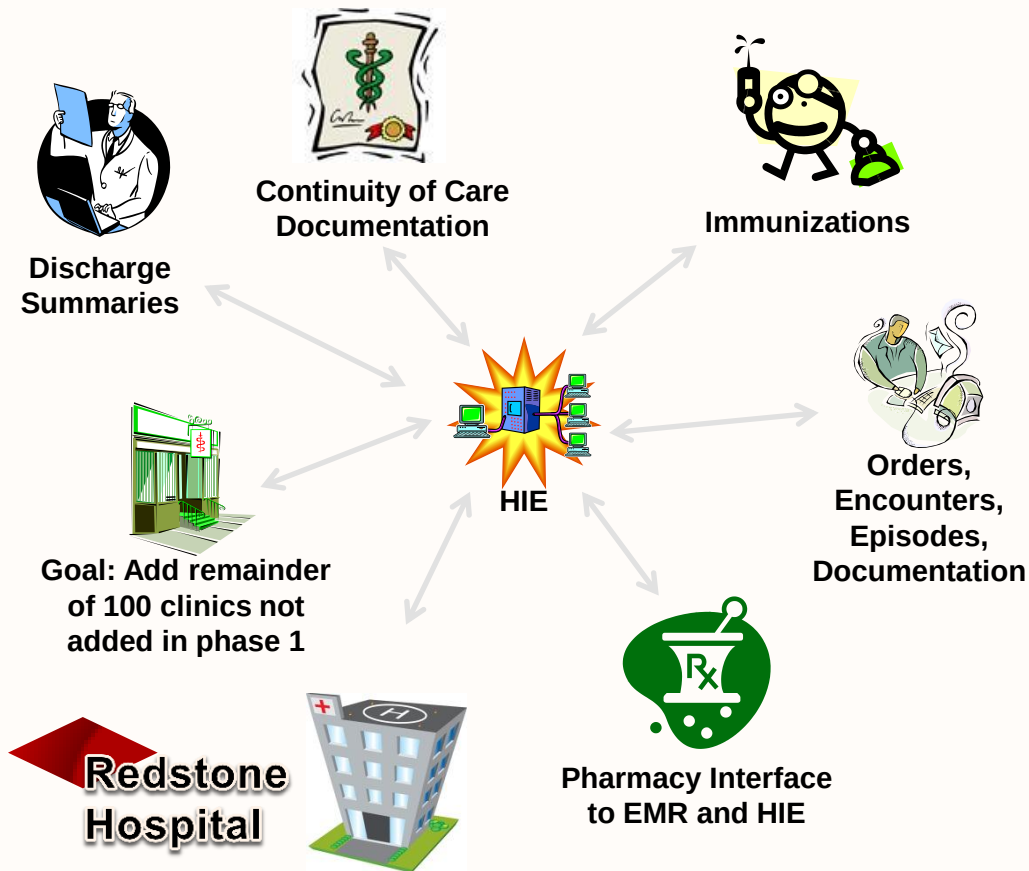
HIE Installation Pilot / Phase 1

Pilot (6 months) / Phase 1 (6 months)



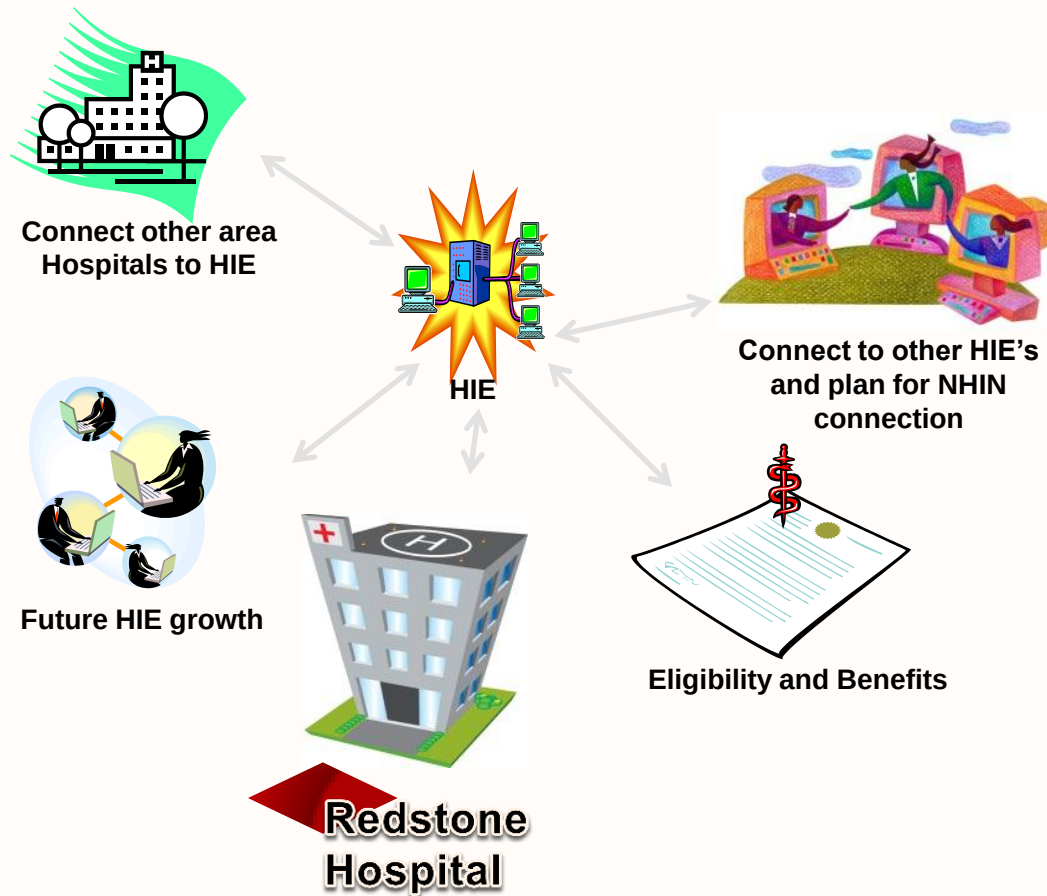
HIE Installation Phase 2

Approx. 12 months



HIE Installation Phase 3

Approx. 12 months and future growth



Conclusion

Redstone HIE Proposal

Long Term Benefits

- HIE will improve the quality of care at Redstone and all HIE member care facilities in the area
- Reduces risk of malpractice suits, and also help drive down the cost of care through improved efficiencies across the region
- Redstone may see an increase in referrals through HIE clinics which can offset initial investment

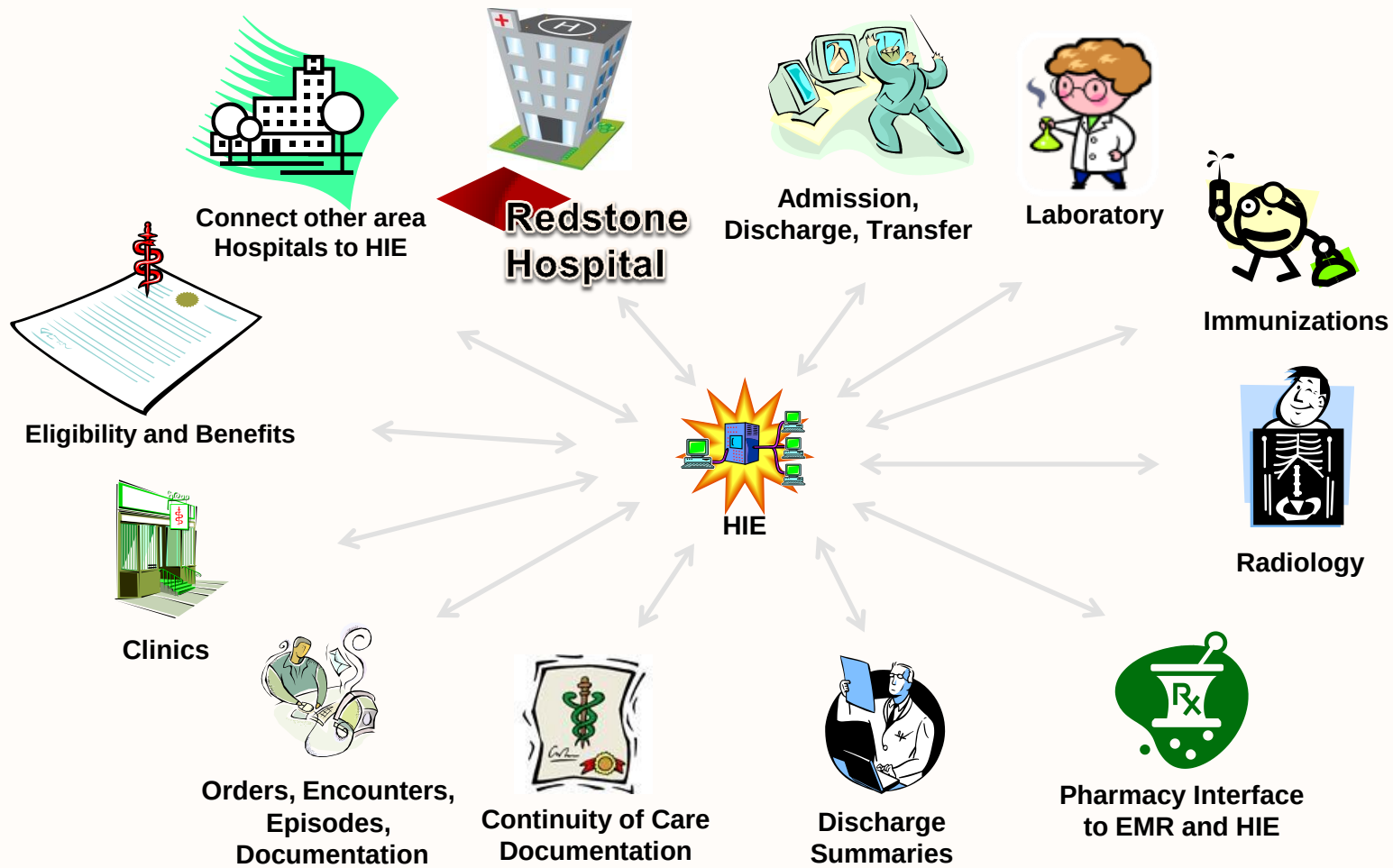
Proposed HIE solution with dbMotion and IBM Initiate

- Allows for the sharing of trusted data entities and will help facilitate HIE participation among competing care facilities
- Provided through a SaaS model it will make it easier for smaller clinics with limited IT staff to come on board
- Eventually, recurring costs needed to maintain the HIE will be shared through all participating members

Phased implementation plan

- Allows Redstone to start modestly with a limited set of functionality As more capabilities are added and additional clinics and hospitals join
- Taking the initiative to launch the HIE Redstone will solidify its position as the leading healthcare facility in the region, show a long term strategic vision, and a willingness to invest in the community at large

Proposed Redstone HIE





THANK YOU

Redstone Valley Hospital HIE Proposal

Team 3

David McKanna

Bob Morgan

Arleen Nomura