Solutions for Healthcare

An Update

The Nationwide Health Information Network

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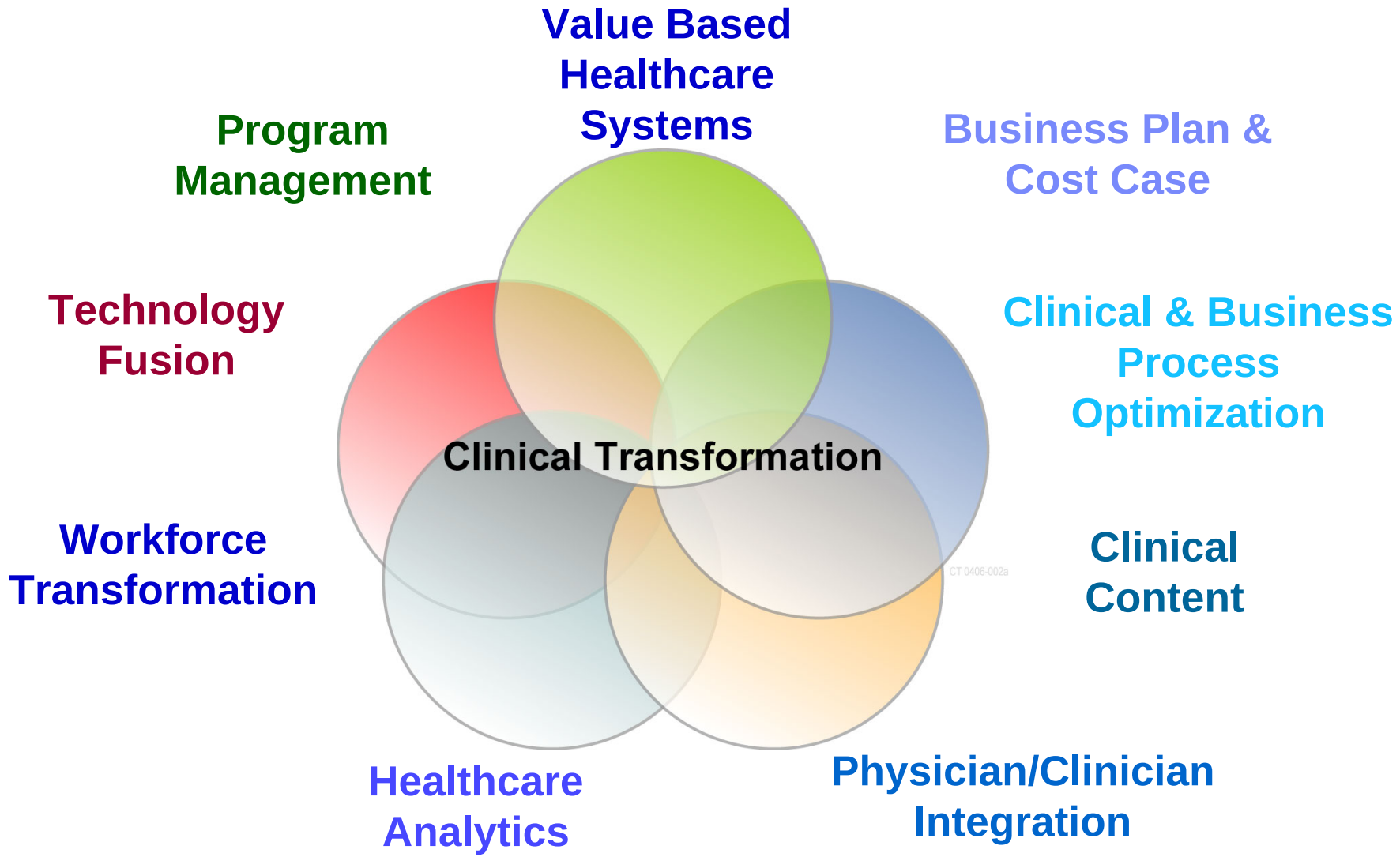
NHIN/HIE Projects

Integrated Approach to Clinical Transformation



The Evolving Healthcare Environment

State

Federal

Private sector

Providers

Insurers

Medicaid/Insurance Companies

State Employees Insurance Fund

Grants/Bids

State NWs to NHIN

Community HIE's

Patient

Physicians

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Nationwide Health Information Network (NHIN -- HHS/ONC)

- Provide consumers with capabilities to manage their information use/flow
- Allow health information to follow the consumer
- Provide critical information to clinicians at the point of care
- Improve HC, population health, and prevention of illness and disease

PHASE 1: Architecture Prototypes

Goal

– Develop and evaluate prototypes of an NHIN architecture that maximize use of existing resources to achieve interoperability among healthcare applications – particularly EHRs

Key Criteria

– Design and demonstrate a standards-based architecture

– Demonstrate within and between HC marketplaces

PHASE 2: Trial Implementations

Goal

State, regional and non-geographic HIEs to become ... "network of networks"

- Organizational governance and trust across competing healthcare markets,
- Health exchange and technical expertise such as demonstrated in the NHIN prototype

Key Criteria

- Demonstrate trial implementations in live HC environments (HIEs)
- Function across HC markets and other participants . . . in Use Case activities
- Include core services and implementation of summary patient record exchange
- Demonstrate via Use Cases (2 Each)

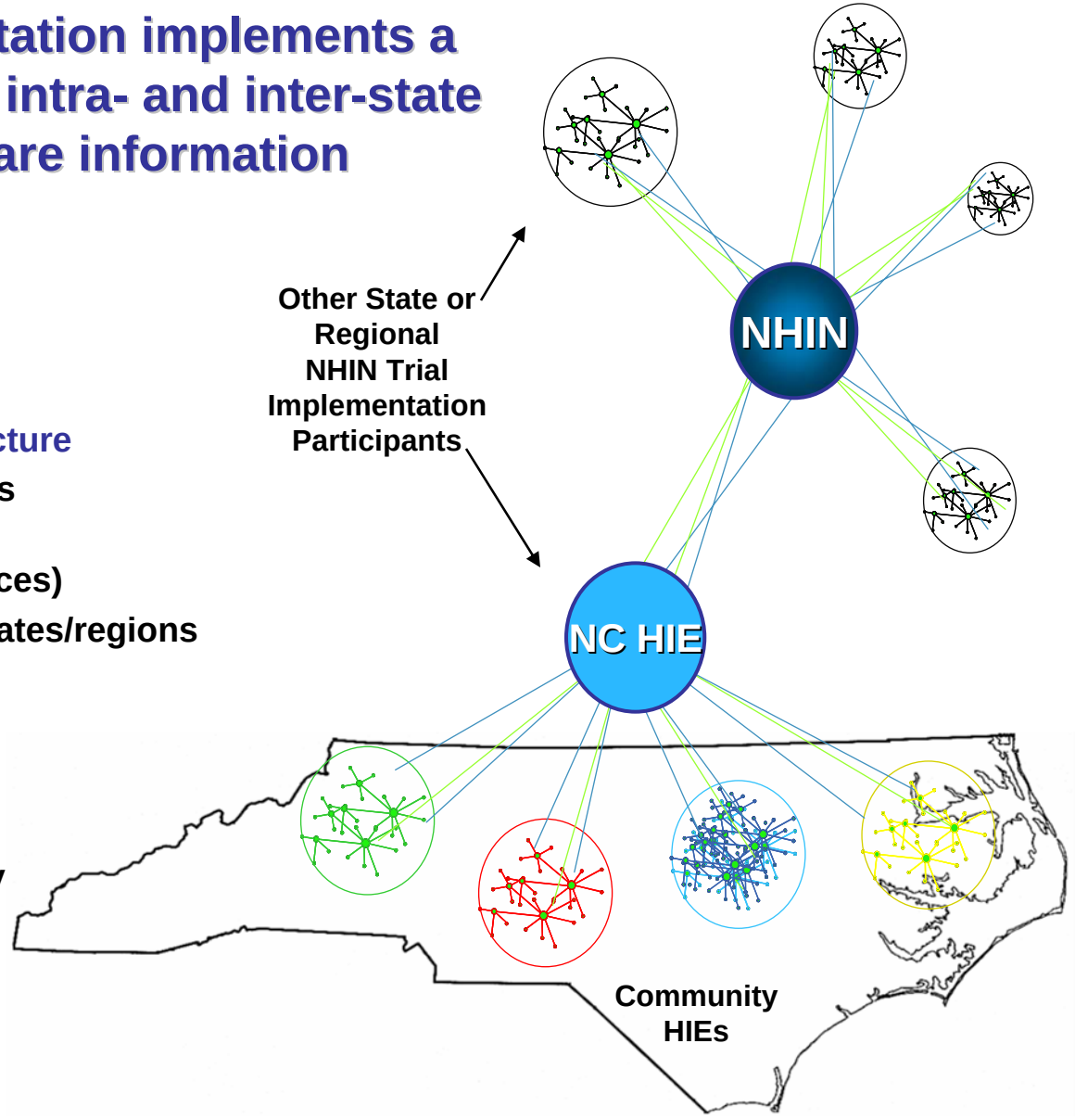
The NHIN Trial Implementation implements a "network of networks" for intra- and inter-state exchange of healthcare information

NC HIE

- Convener, Educator, Facilitator
  - Privacy/security framework
  - Standards/reference architecture
- Incubator for piloting new concepts
- Utility for Foundational Services (e.g., EMPI, Record Locator Services)
- NHIN compliant linkage to other states/regions

Community HIEs

- Encourage EHR adoption and "last mile" connectivity
- Develop real-time patient summary and data aggregation capabilities
- Provide training and education
- Engage non-provider stakeholders (payers, employers, public health)



The Nationwide Health Information Network (NHIN) Use Cases provide a blueprint for Provider, Consumer and Population Health interoperability

AHIC USE CASES

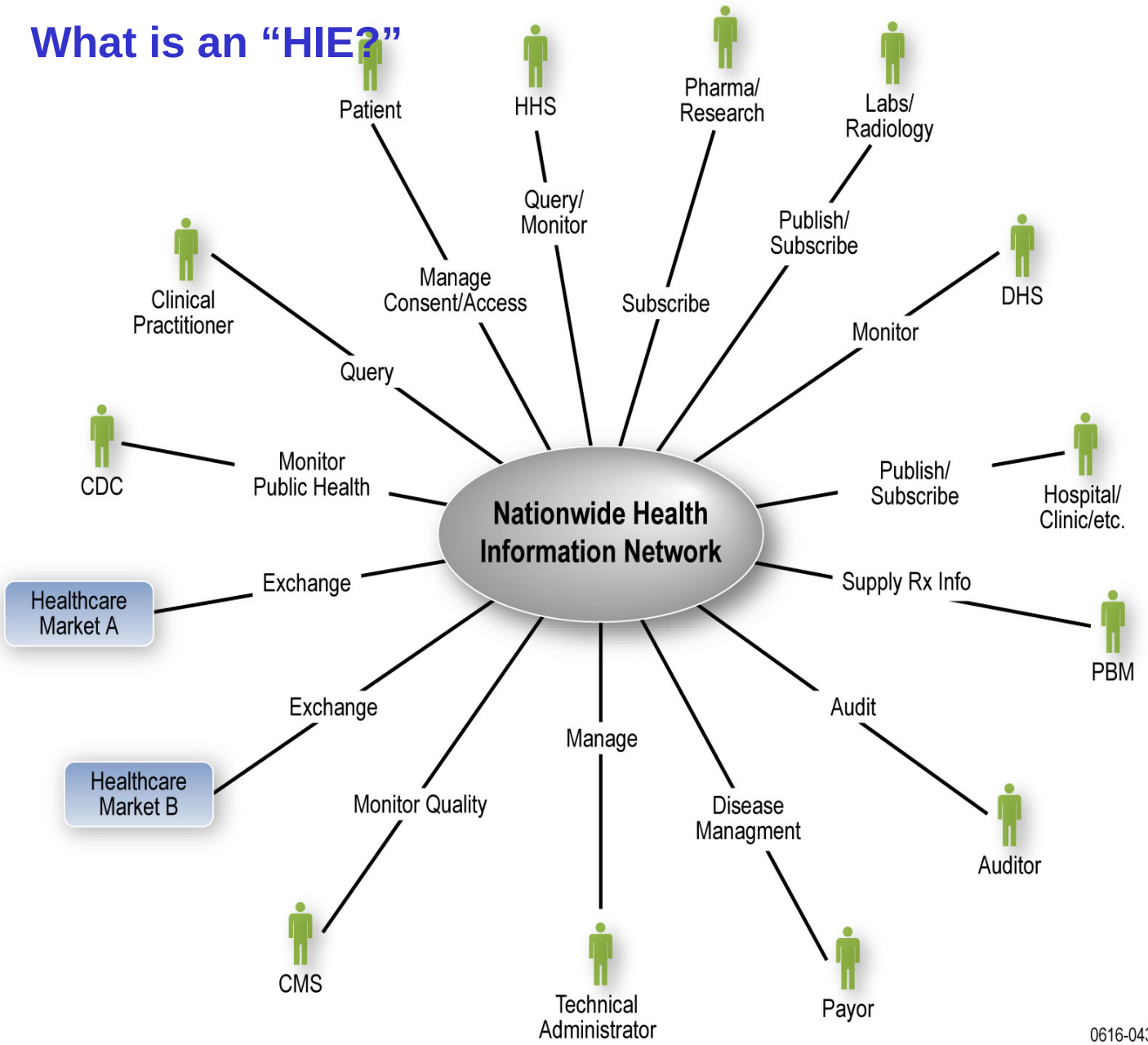
PROVIDER	
▪ EHR (LAB RESULTS REPORTING)	2006
▪ EMERGENCY RESPONDER EHR	2007
▪ MEDICATION MANAGEMENT	2007
▪ CONSULTATION & TRANSFERS OF CARE	2008
▪ PERSONALIZED HEALTHCARE	2008
CONSUMER	
• CONSUMER EMPOWERMENT (REG. & MEDICATION HISTORY)	2006
• CONSUMER ACCESS TO CLINICAL INFORMATION	2007
• REMOTE MONITORING	2008
• PATIENT-PROVIDER SECURE MESSAGING	2008
POPULATION HEALTH	
• BIOSURVEILLANCE (VISIT, UTILIZATION, LABS)	2006
• QUALITY	2007
• PH CASE REPORTING	2008
• IMMUNIZATIONS & RESPONSE MANAGEMENT	2008

FUNCTIONAL REQUIREMENTS

Core Services Required:

- Patient ID Cross-matching
- Record Locator Service
- Federated and Centralized Document and Data Storage
- Physician Access Management
- Lab/Rx Exchange HIE Integration (Gateways and Adapters)
- Audit Logging and Security
- Normalization Services and Claims Coding
- Authorized User Identification Proofing and Access Management
- Consumer – Automated Consent Management
- Cross-community EMR Integration
- Triggered Data Collection from All Major Entities
- Secure, bi-directional (Role-based) User Communication
- Workflow Management (e.g., transfer of care)

What is an "HIE?"



- **Formal & tightly coupled (THINC)**
- **Informal & loosely affiliated (NCHICA)**
- **Large health system**
- **Coalition of smaller institutions**
- **Healthcare stakeholders**
  - **Reference Labs**
  - **Public Health**
  - **Research**
- **Payer driven or payer participatory**
- **Employer driven (Leapfrog)**
- **HOW WILL HIE'S PLAY IN A NATION WIDE NETWORK?**

NHIN Trial Implementation Requirements*

- **Health Information Exchange must include:**
  - **Five or more competing provider organizations**
  - **Different types of provider organizations, including independent physician practices and safety net providers**
  - **Both inpatient and outpatient settings**
  - **Both provider applications (EMRs) and consumer applications (PHRs)**
  - **Applications from multiple competing vendors**
- **"Implementation of operation-capable systems and processes, but does not require full-time, live, production operations"**

*from *The Office of the National Coordinator for Health Information Technology*

NHIN Architecture Project Guiding Principles

- **Community-Centric**
  - Document repositories normalize and store clinical data within a community
  - Can be hosted by individual hospitals/practices and/or shared within the community
  - Community hub provides MPI, document locator, security and support services
  - The community hub is the gateway to other communities
- **Drive and conform to standards**
  - Instantiation of IHE interoperability framework
  - Clinical events stored as HL7 CDA(r2)-compliant documents
  - Cross-community search & retrieval
- **Provide security & privacy w/o sacrificing usability or research value**
  - Anonymous/pseudonymous data that can be re-identified as needed/permitted
  - Supports other data aggregates (registries, biosurveillance, outcomes analysis, quality of care)
- **Practical**
  - Scalable and cost-effective at every level of practice
  - Point-of-care performance is critical to adoption

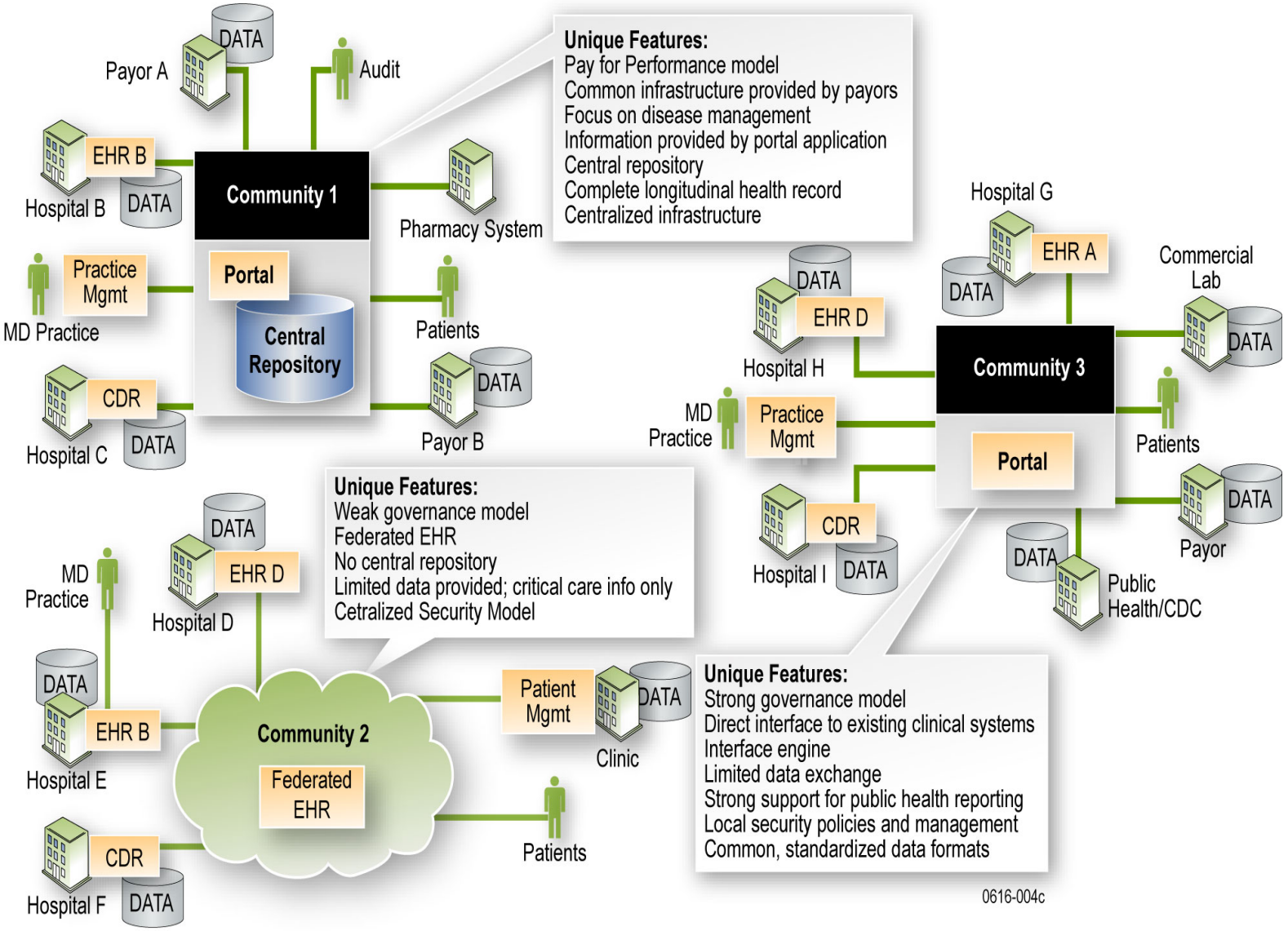




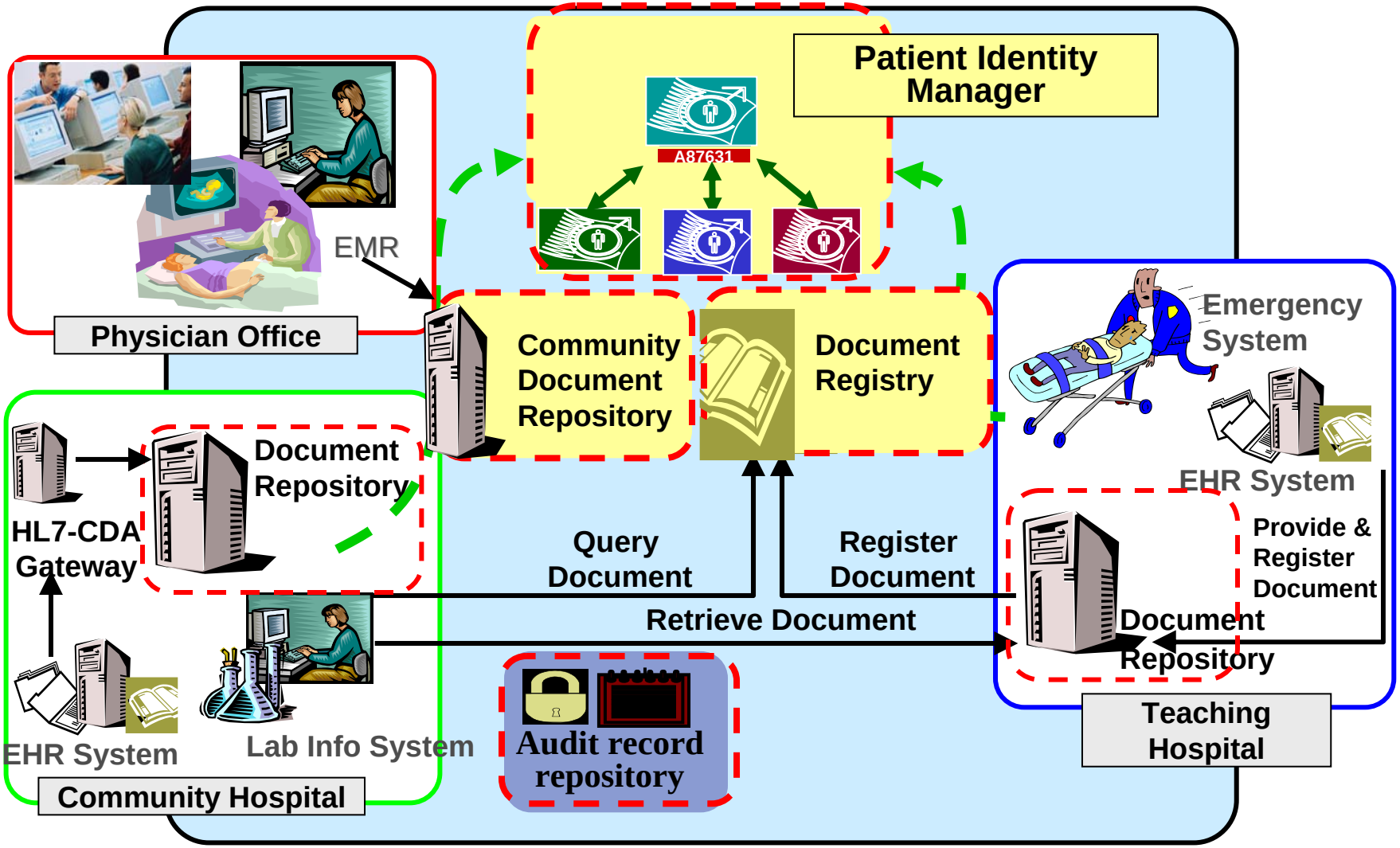
Key Differentiators of the IBM HIE Architecture

- **Standards Based**
  - Built in cross enterprise interoperability
  - Adheres to the HITSP standards
  - Supports IHE profiles (100+ vendors have already adopted)
- **Flexible Architecture**
  - Functionality driven by the healthcare community being served
  - Fully Federated, Totally Centralized, or Hybrid
  - Utilizes a registry but does not require data to be stored centrally
  - Hardware and software agnostic
  - No “rip and replace” of existing systems
- **Scalable and Extensible**
  - Communities can grow from a few providers to a large network
  - Geographic or non-geographic communities
- **Secure**
  - Patient controlled
  - Role based authorization

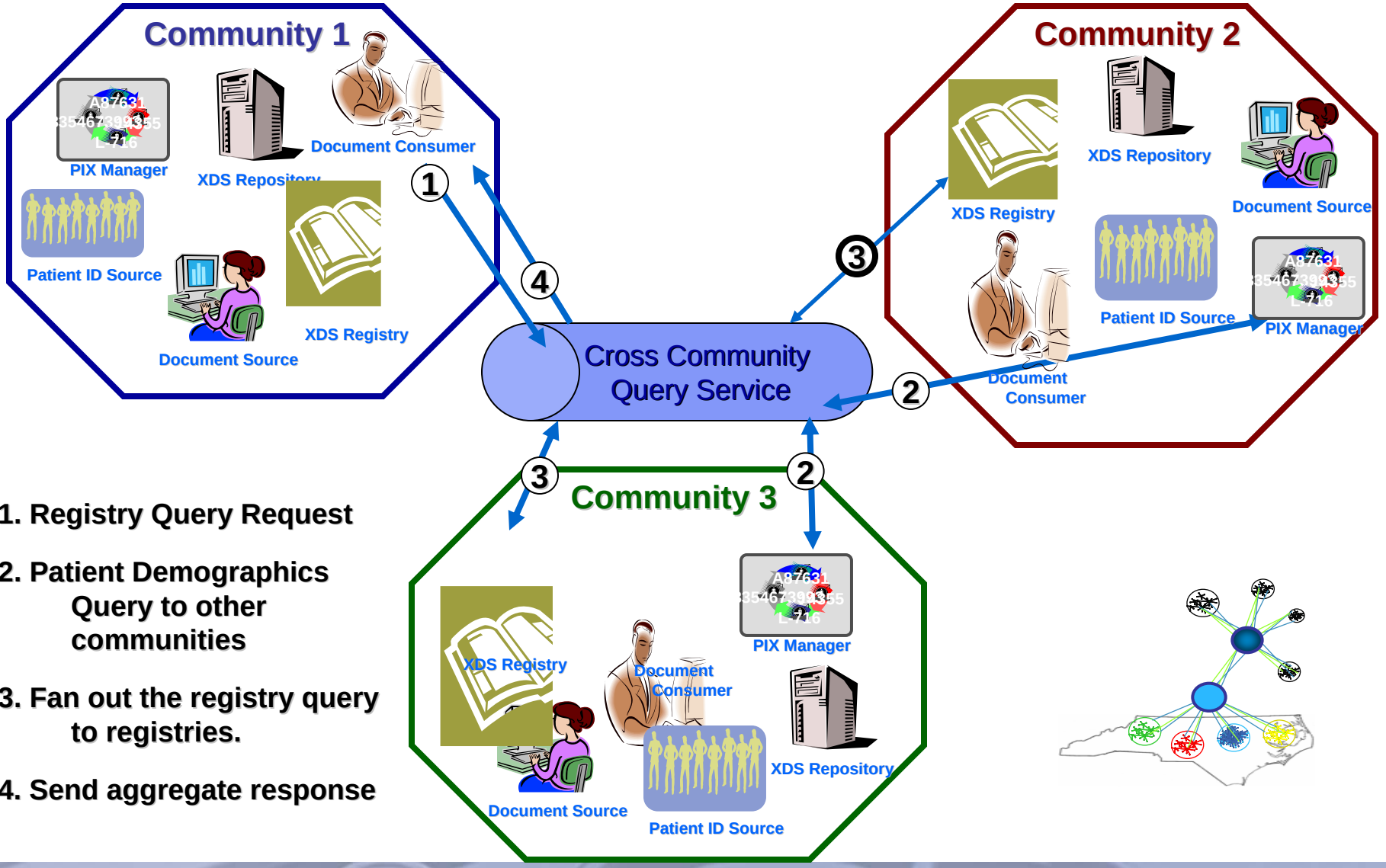
Interconnecting Health Information Exchanges with Differing Architectures



Generic HIE Community HUB



IBM's HIE Architecture: Cross-Community Services

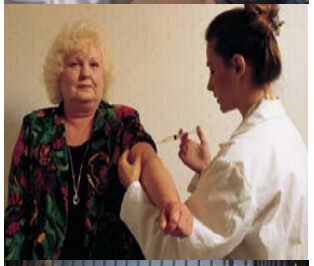


1. Registry Query Request
2. Patient Demographics Query to other communities
3. Fan out the registry query to registries.
4. Send aggregate response

The HIE "Buzz" Around The Country

- **HIEs (200 in number and growing), but …**
  - **Consolidation is in motion towards larger statewide or non-geographic HIEs**
- **Community HIE's Priority Is To …**
  - **Encourage physician adoption of EMRs**
- **States are well positioned to offer cross-domain utility services**
  - **Foundational to interoperability (e.g., identity and directory services)**
  - **Momentum for professionally run, subscription-based "utilities" is growing**
- **Aggregate Uses of Data provide greatest long-term revenue growth potential, but …**
  - **Prerequisites are secure exchange infrastructure and consent management**
- **Non-Geographic HIEs**
  - **Incentive and ability to provide cross-domain linkages and analytic services**
- **Consumers will demand**
  - **A more active role in health care data management**
  - **Growing responsibility in their health outcomes**




What Is Happening?

▪ HHS/ONC NHIN Phase 2	15 State Awards, RFP released 6/6/07
▪ CDC HIE (NHIN Compliant)	10 State Awards, RFP out, due 6/21/07
▪ Military Health System (NHIN Connectivity)	5 State Pilots (Model) Military to Community Providers (EHR)
▪ MHS TO VA Interoperability	
▪ MHS: Other Activity	Treatment and Research
▪ Medicaid Transformation	$103M awarded, 27 stated $ 47M in 2007-2008
▪ State Activity	XX states with Task Forces XX states funded by Legislature Grants to jump start EHR's Multiple RFI's and RFP's XX state utilities, HIE's
▪ Bridges to Excellence	Employers active
– Pilot programs	Wellness and Disease Mgmnt Payment Mechanisms Quality Indicators
▪ Other Grants:	AHRQ, Robert Wood Johnson
▪ Congress:	Starck Law relaxation PTST and TBI funding HIPAA, CLIA (Regulatory Agecies)

TO BE SUSTAINABLE, COMMUNITY HIES AND HRBS MUST:

1) Drive physician adoption by offering compelling value
2) Provide services that attract stakeholders with an ability to pay

Business/Financial Challenges

- **Few business models are compelling and sustainable without participation from health plans, large employers or state agencies**
- **Need to define (and broker) redistribution mechanisms to ensure fair distribution of costs and benefits**

Adoption / Process Challenges

- **Few exchanges offer compelling value propositions without participation from individual physician practices**
- **Few exchanges offer compelling value propositions to physicians without:**
  - **Content that is valuable enough to them to sacrifice time to look up or contribute to**
  - **Ease of use and sensible workflow and navigation**

Many HIE Program Considerations Affect Cost and Sustainability

- Record Locator Service
- User Authentication
- Internal integration of HHS systems
- Wellness and Disease Management
- E-Prescribing and Pharmacy management
- Error, Waste, Fraud and Abuse Management
- Entity Analytic Solutions (EAS)
- Medication Reconciliation and Medication Risk Management
- Patient Risk Scoring Solutions and Predictive Modeling
- Emergency Response Technology
- Geo-Mapping Solutions for Risk Scoring for Disease Surveillance
- Peer-To-Peer Comparative Clinical Support Data
- High-Risk Case Management
- Others

Potential Future HIE Directions

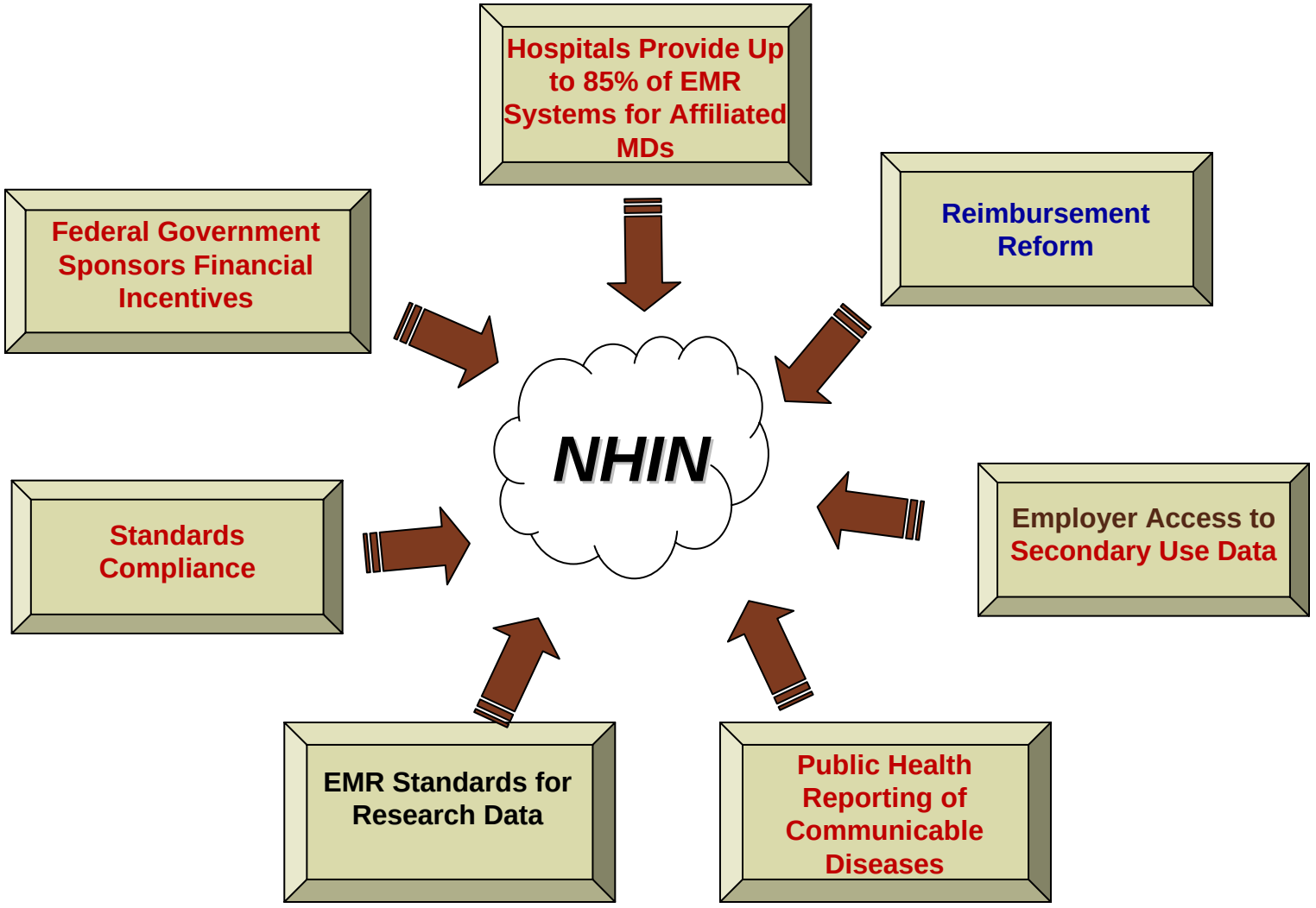
Advanced Interoperability Services:

- **Analytic tools** to support secondary data uses
- **Digital Rights Management**, issues …
  - Consent management
  - Metadata
  - Role-based access
- **Health Record Banks**
- **Nationwide alliances of large players** (e.g., employers, payors, pharmaceuticals) could produce a strong demand for open standards-based HIN Service Providers
- **Linkage to consumers** – directly linking users of data with originators of data for consents, permissions and micro-payments (no middlemen)



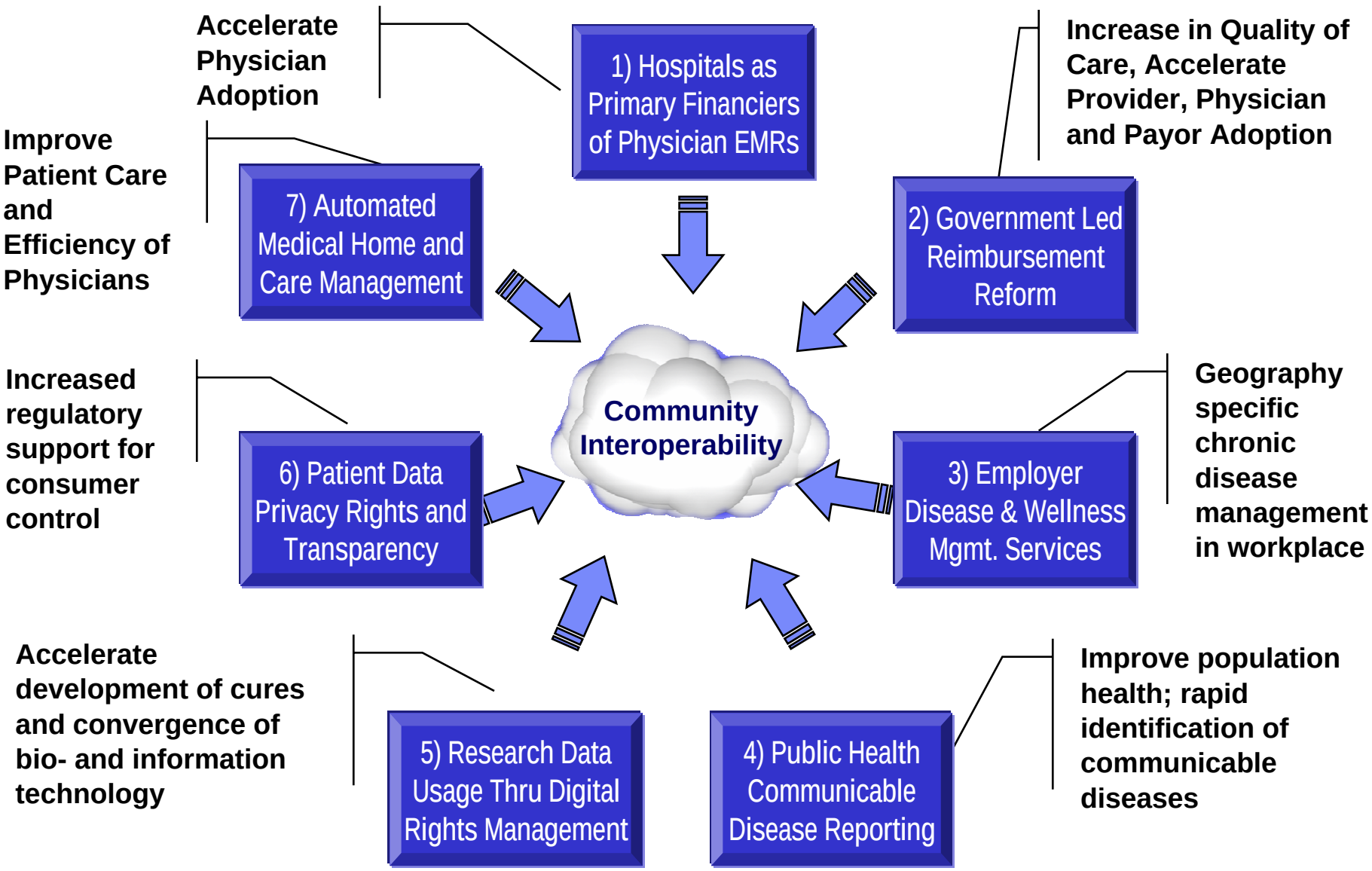


Levers May Change The HIE Market Context



The RHIO market is a dynamic market - public and private levers may accelerate adoption

Potential Mega-Trends May Accelerate (or inhibit) Health IT Adoption Rates at National, State and Local levels







2015: Will we get there in time?

- **DRIVERS: Factors That Stimulate Change**
  - **Technology** use achieves productivity gains
  - **Aging and overweight** populations
  - **Chronic illness** consumes **75%** of the HC resources
  - Growing awareness of **adverse events** (770,000 injuries/yr)
  - **1 in 4 tests is repeated**
  - **Research:** 17 year cycle bench to bedside cycle
  - **Regenerative medicine:** renewable parts through stem cells
  - **Information based medicine**
  - Personal Health Information (PHI) needed at the point of care
  - **Self-insured employers:** assertive, promote interests and employees
- **INHIBITORS: Forces that support the status quo and prevent change**
  - **Financial Constraints:** the pool is not limitless
  - **Lack of aligned incentives** among stakeholders:
    - Payers, Providers, Patients
  - **Security and Privacy** concerns
  - **Information Overload** and Proliferation
  - **Societal norms:** Patients, Providers, Payors, Taxpayers

The Evolution Of The Healthcare System Is In Our Hands

Information Technology Plays A Large Role In Reducing Healthcare Costs

- Architectures that are extensible and expansive
- Healthcare standards, both clinical and technical
- Interoperability and data access or exchange between healthcare providers and clinicians
- Patient Access
- Healthcare Data Analytics
- Quality Programs
- Secondary use of data linking "research bench to bedside"
- Public Health





ADMINISTRATIVE COSTS OF HEALTHCARE

- The Health Affairs Journal estimates administrative costs account for 25% of health care spending. (2005)
- A California study suggests that private insurers spend 9.9% of revenue on administration.
- Physician offices spend 27% on administration
- Hospitals spend 21% on administration
- An American Medical Association study estimates:
  - A physician spends six minutes on each claim
  - Physician staff members spend one hour per claim

INSURANCE PREMIUMS FOR HEALTHCARE

- In 2005, total national health expenditures rose by 6.9%, (2 X inflation) (Source: National Coalition on Health Care)
- In 2006, employer health insurance premiums increased by 7.7%
- In 2006, the annual employer health plan premium for a family of four was nearly $11,500
- 2000 to 2006:
  - Health care premiums had risen 87%
  - Cumulative inflation was 18%
  - Cumulative wage growth was 20%
  - (Source: Kaiser Family Foundation and Hewitt Associates)

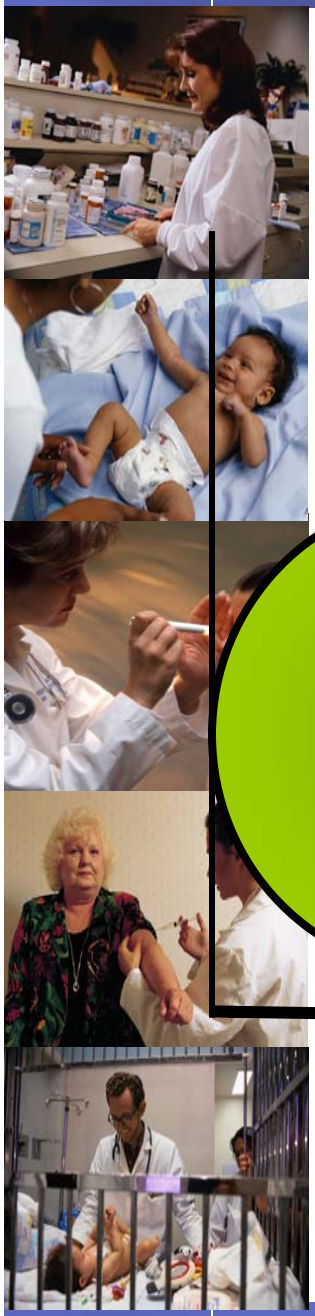
Obesity – A Major Epidemic and a Major Cause

Obesity is Now An Epidemic

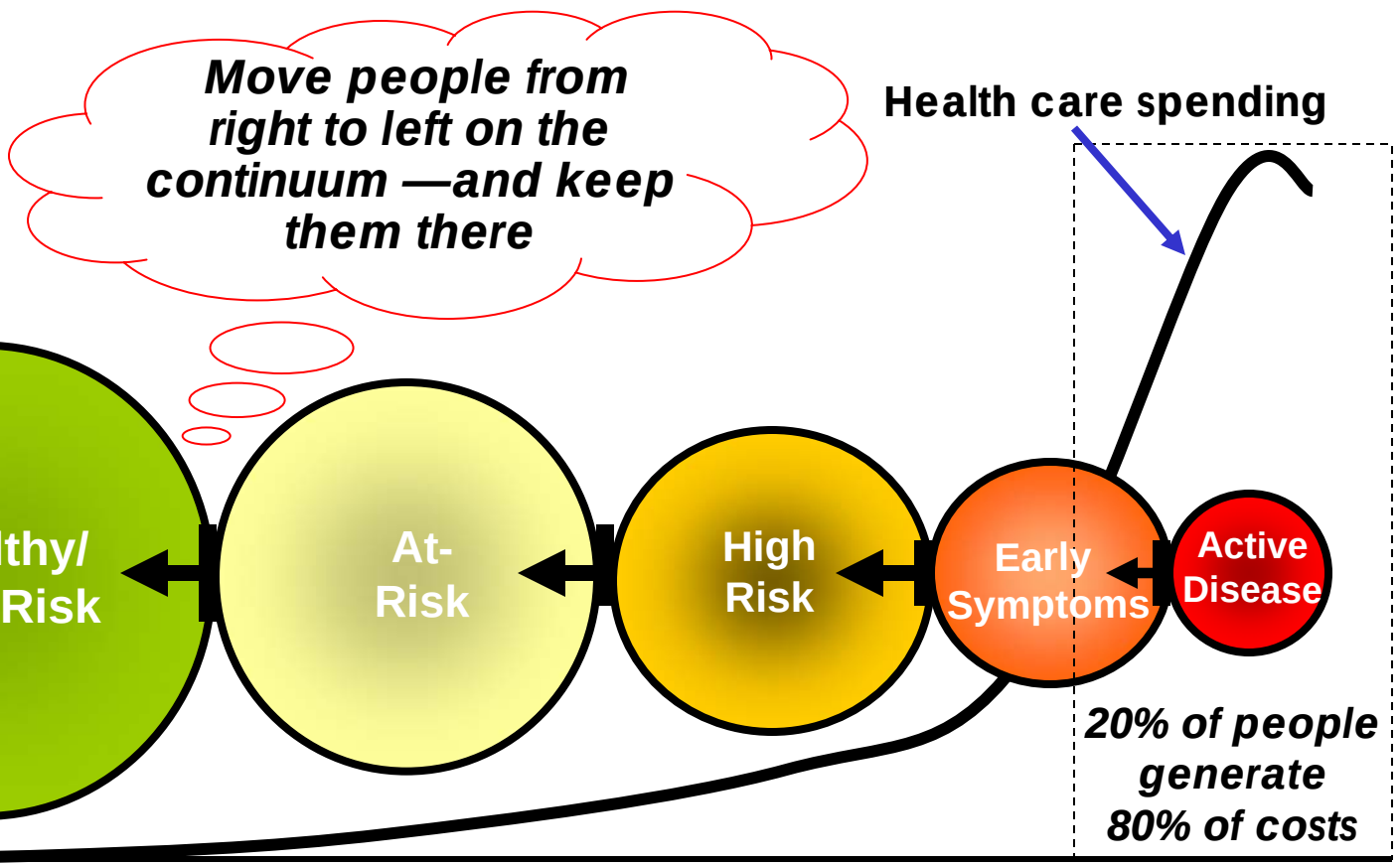
- 33% of Americans are overweight.
- The percentage of overweight children has more than doubled, with adolescent rates tripling since 1980.
- Obesity alone costs U.S. companies $13 billion in health costs and 39 million workdays lost each year.
- Obesity links to chronic diseases such as diabetes, arthritis, heart disease and cancer. These chronic diseases combined cost employers more than $220 billion annually in medical care and lost productivity.
- Obesity has produced a chronic epidemic of Type 2 Diabetes among 20.8 million children and adults (7% of the Population) having diabetes today.
- 54 million people have sufficiently high glucose levels to be considered at risk for diabetes.

Chronic Disease Management

- **97% of the $2 trillion spent each year on health care is spent on disease management**
- **Although chronic diseases are among the most prevalent and costly health problems, they are also among the most preventable**
- **More than 133 million Americans live with one or more chronic conditions, with millions of new cases are diagnosed each year**
- **7 of every 10 deaths in the United States are caused by three chronic diseases: heart disease, cancer, and diabetes**
- **The indirect costs of poor health are 2 to 3 times that of direct medical costs**
- **Productivity losses related to personal and family health problems cost U.S. employers $1,685 per employee per year, or $225.8 billion annually**



THE ULTIMATE GOAL . . .



A value-based health care system