

## Trends in Healthcare



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- Healthcare : where it is headed and trends
- Desired State
- How to get there
  - Architecture
  - Information Agenda Approach
- Case Studies



# Healthcare Providers are Experiencing the Most Challenging Environment in Decades...

- **Reduce Operating costs**
- Improve support for **clinical applications** availability
  - Availability , authentication & access controls
- Support EMR and integrate with Health Information Exchange (HIE) and Regional Health Information Organizations (RHIO)
- Manage **regulatory** changes and maintain **compliance**
- Improve **patient care** without increasing costs
- Prevent internal & external **security breaches**
- **Manage data growth** – analytics, large medical images
- Facilitate **availability & reliability of assets**
- Support for move to **personalized healthcare**
- Improved **clinician satisfaction**



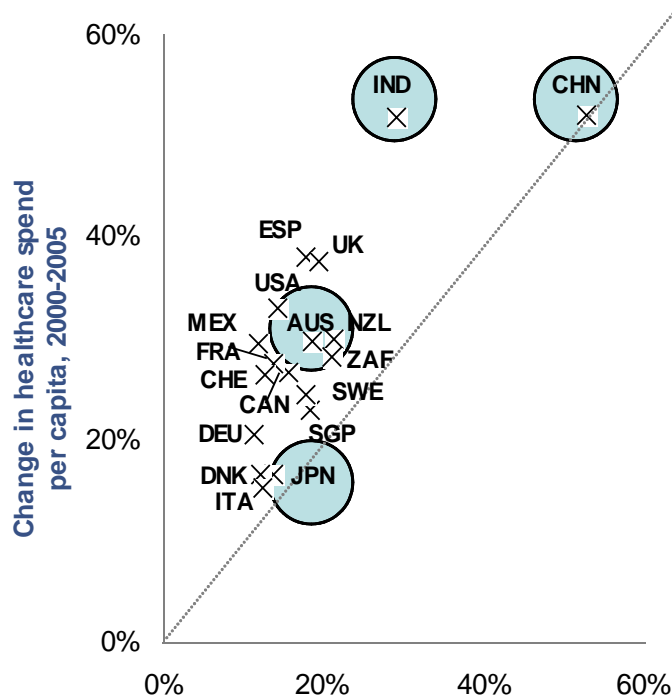


# Healthcare Systems Worldwide

Increasing Costs, Inconsistent Quality & Inaccessible Care

## Growth in healthcare expenditures<sup>1</sup>

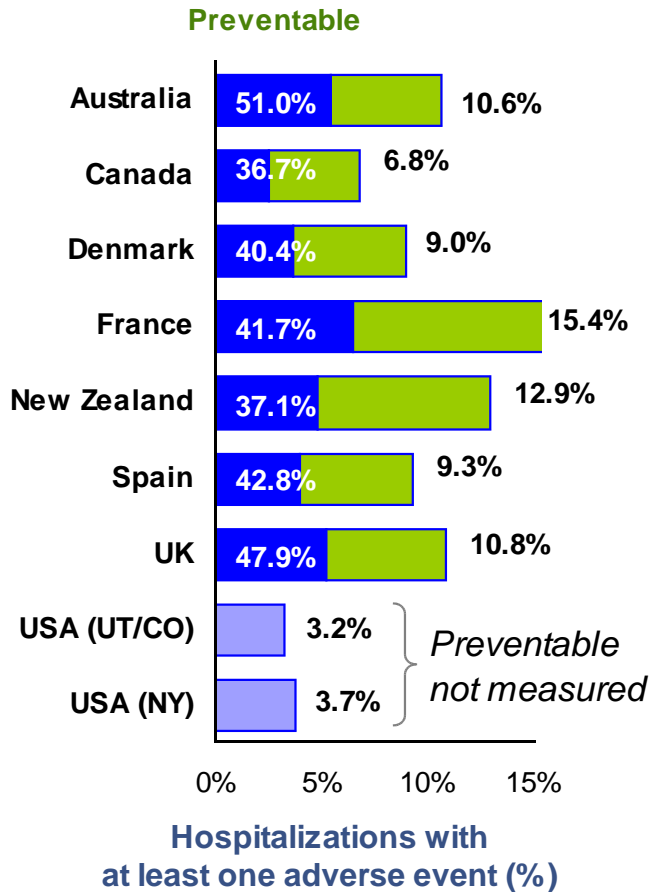
(Healthcare spend vs. GDP, per capita)



Change in GDP per capita, 2000-2005

## Occurrence of adverse events at hospitals<sup>2,3,4</sup>

(Percentage of total and preventable)



Hospitalizations with at least one adverse event (%)

## Examples of healthcare access issues<sup>5</sup>

(Select countries)

- **Australia:** 10% wait 6+ days or never for Dr. appointment (vs. 3% NZL, 15% UK, 23% US, 36% Canada)
  - **China:** 39% rural, 36% urban cannot afford professional care
  - **India:** Public health system suffers from inadequate infrastructure and high employee absenteeism (40%)
  - **Japan:** Long outpatient wait times at hospitals, consult times shorter
- By Comparison:*
- **U.K.:** More than 40K Britons wait more than a year just for diagnosis
  - **USA:** 47M uninsured, 15M underinsured

Source: Healthcare 2015 & Care Delivery : Delivery models defined, competencies refined  
September 2008

Note: (2) An adverse event is defined as "an unintended injury or complication which results in disability, death or prolongation of hospital stay, and is caused by health care management rather than the patient's disease"; (3) despite attempts to minimize inter-study differences, some variation may be explained by methodologies (Marang-van de Mheen, 2007)  
Source: (1) WHO (2007); (4) See Marang-van de Mheen, et al. International Journal for Quality in Health Care. 2007 Dec;19(6):399-406.





# Healthcare Industry Forces

## Influencing the Sustainability of Healthcare Systems

### Healthcare 2015 Drivers

- Globalization
- Consumerism
- Changing demographics and lifestyle
- Diseases that are expensive to treat
- New Treatments and Technologies

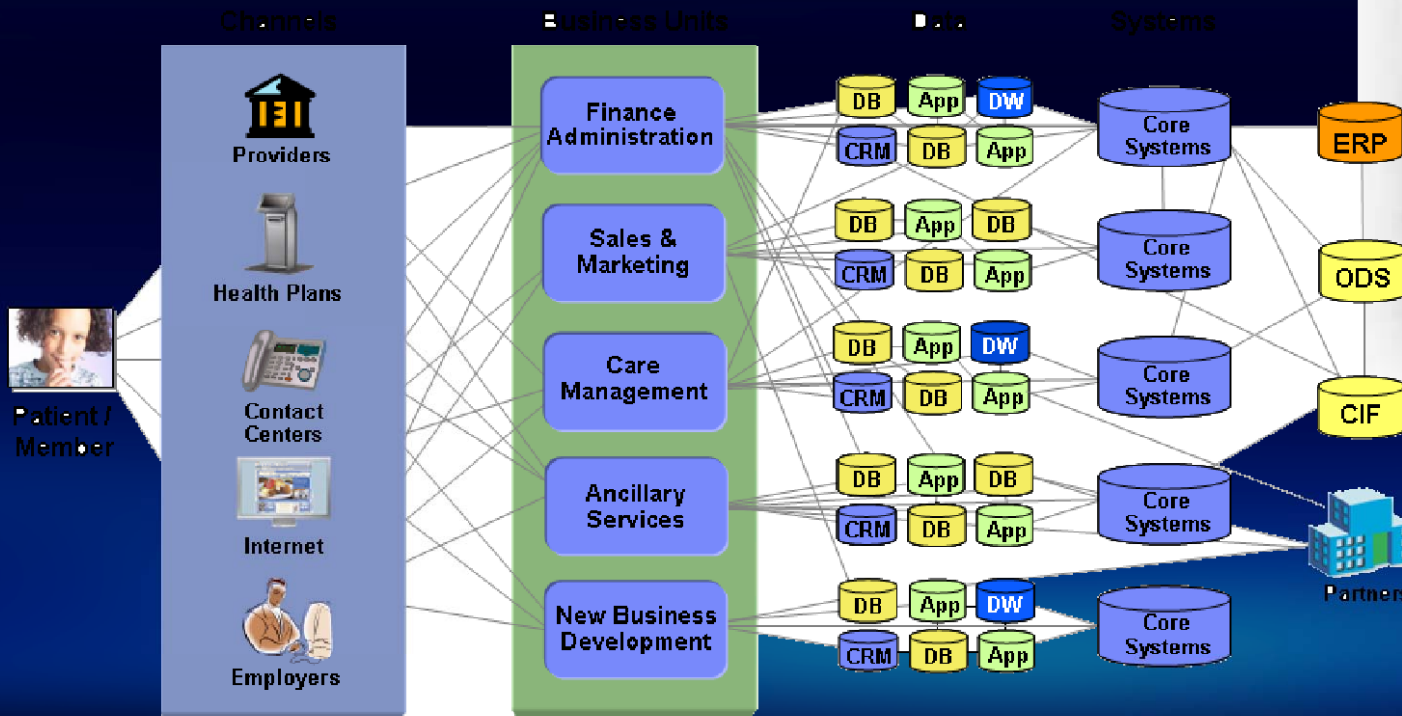
### Key Inhibitors Threaten to Maintain Status Quo

- Financial constraints 
- Societal expectations and norms 
- Lack of aligned incentives 
- Inability to balance short- and long-term perspectives 
- Inability to access and share information 

### Impact on Healthcare

- Increasing focus on value 
- Increase in citizen responsibility 
- New approaches to promoting health and delivering care 
- Growing resource challenges 

# Healthcare Challenges Today



## Challenges...

- ✓ Data quality issues
- ✓ Redundant data structures

## Results in...

- ✓ Poor cross channel communication
- ✓ Likelihood for inconsistencies in metrics
- ✓ No predictable source of truth

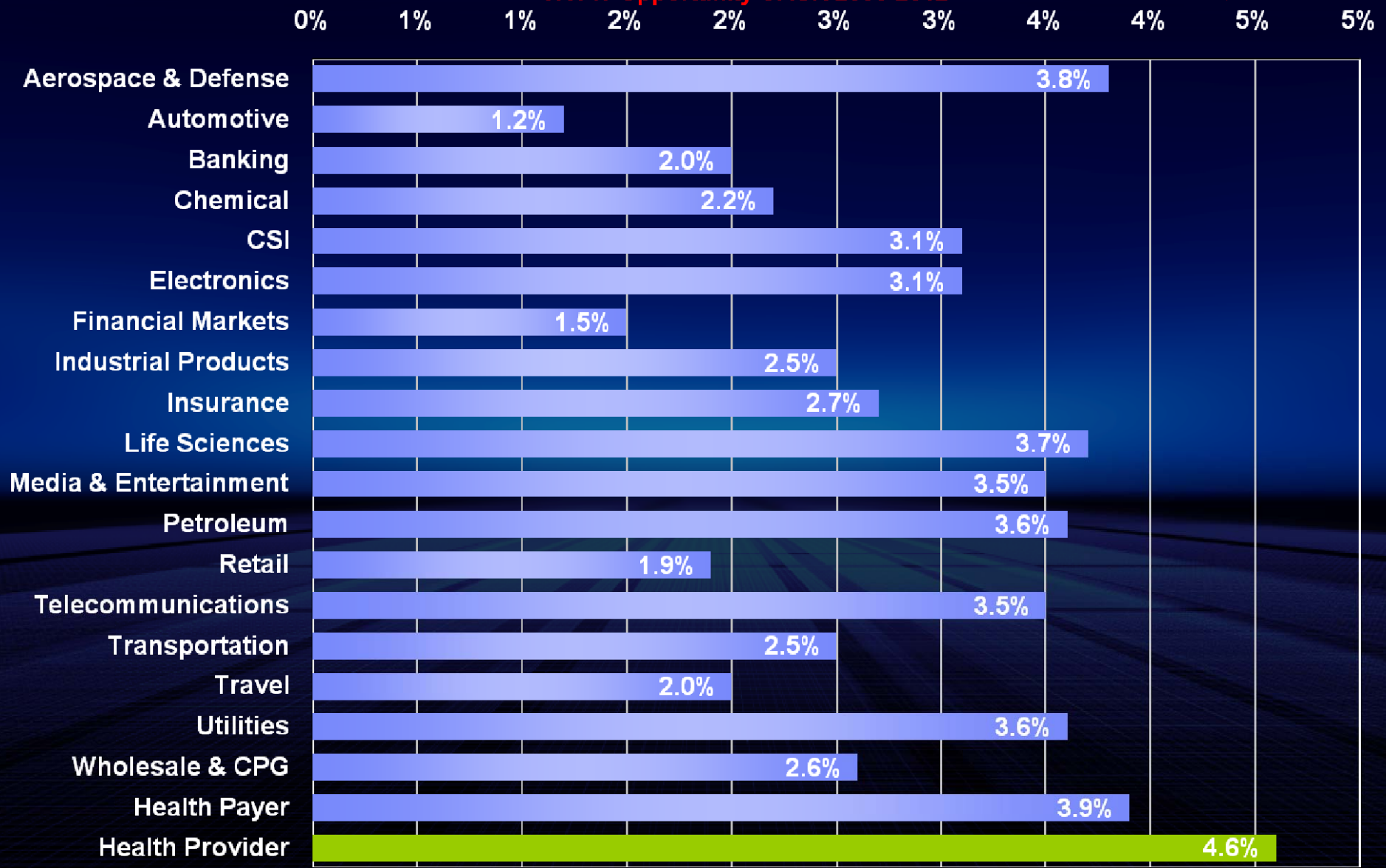
**“The Healthcare industry  
...wastes billions in non-integrated,  
non-interoperable IT infrastructure”**

— Richard Mark Soley  
Chairman and Chief Executive Officer of OMG  
Executive Director of the SOA Consortium



Despite the economic recession, HC Provider segment is forecast to have the highest 4 yr CAGR among all industries

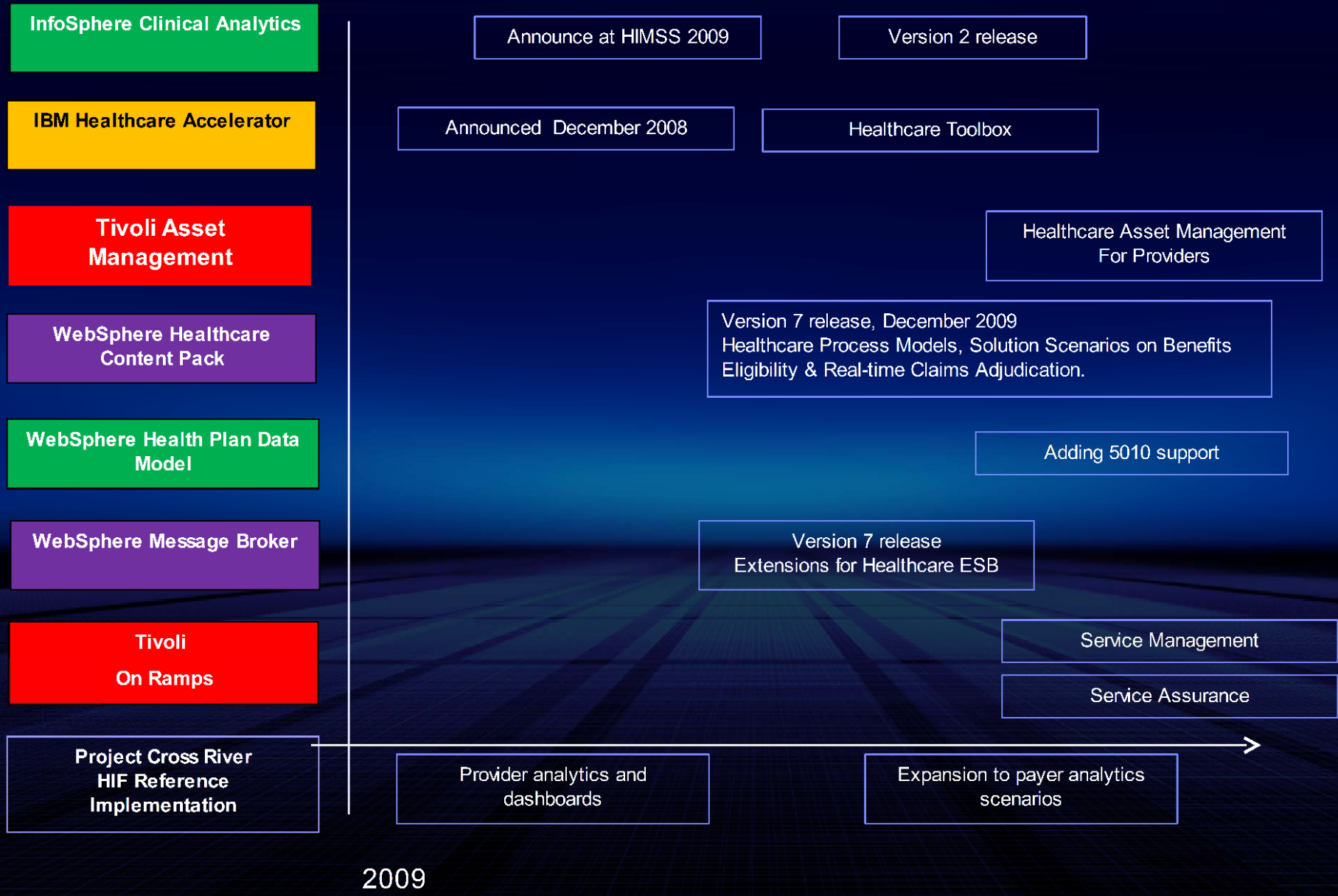
WW IT Opportunity CAGR 2008-2012 .....>







# Health Care Integration Framework Roadmap 2009-10



# Health Integration Framework For Providers/Plans



## Industry Solution

***Solves a customer's business problem through a combination of:***

- Industry and subject matter expertise
- Defined IP, applications, tools, and methodologies
- Business Partner content
- Global delivery model

## Industry Framework

***A software platform based on business specific usage pattern, and:***

- Includes industry-specific extensions
- Business and technology standards
- Based on SOA
- Leverages an ecosystem of independent partner assets



Desired state..

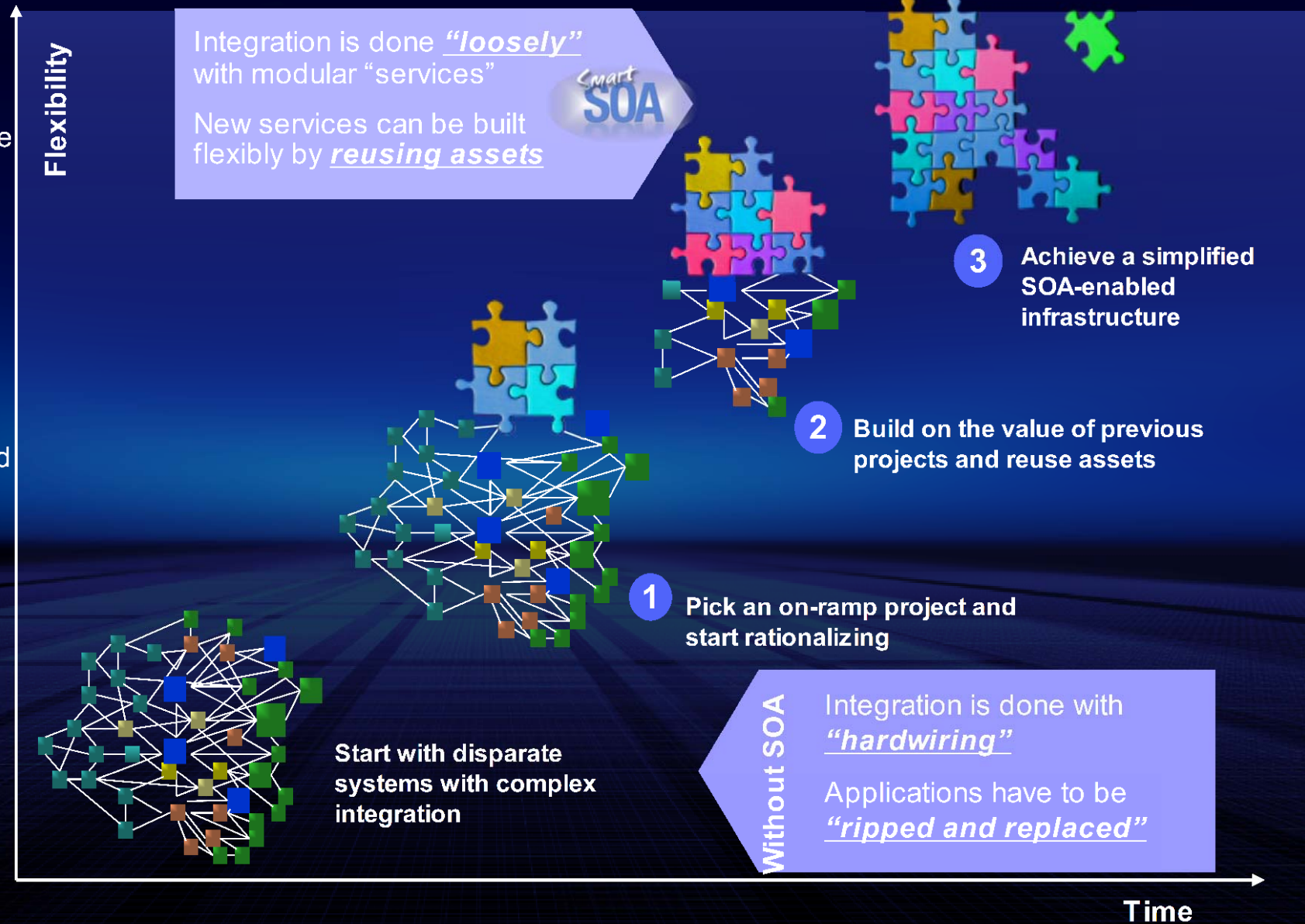


# Solution On-Ramps Drive Progressive Transformation

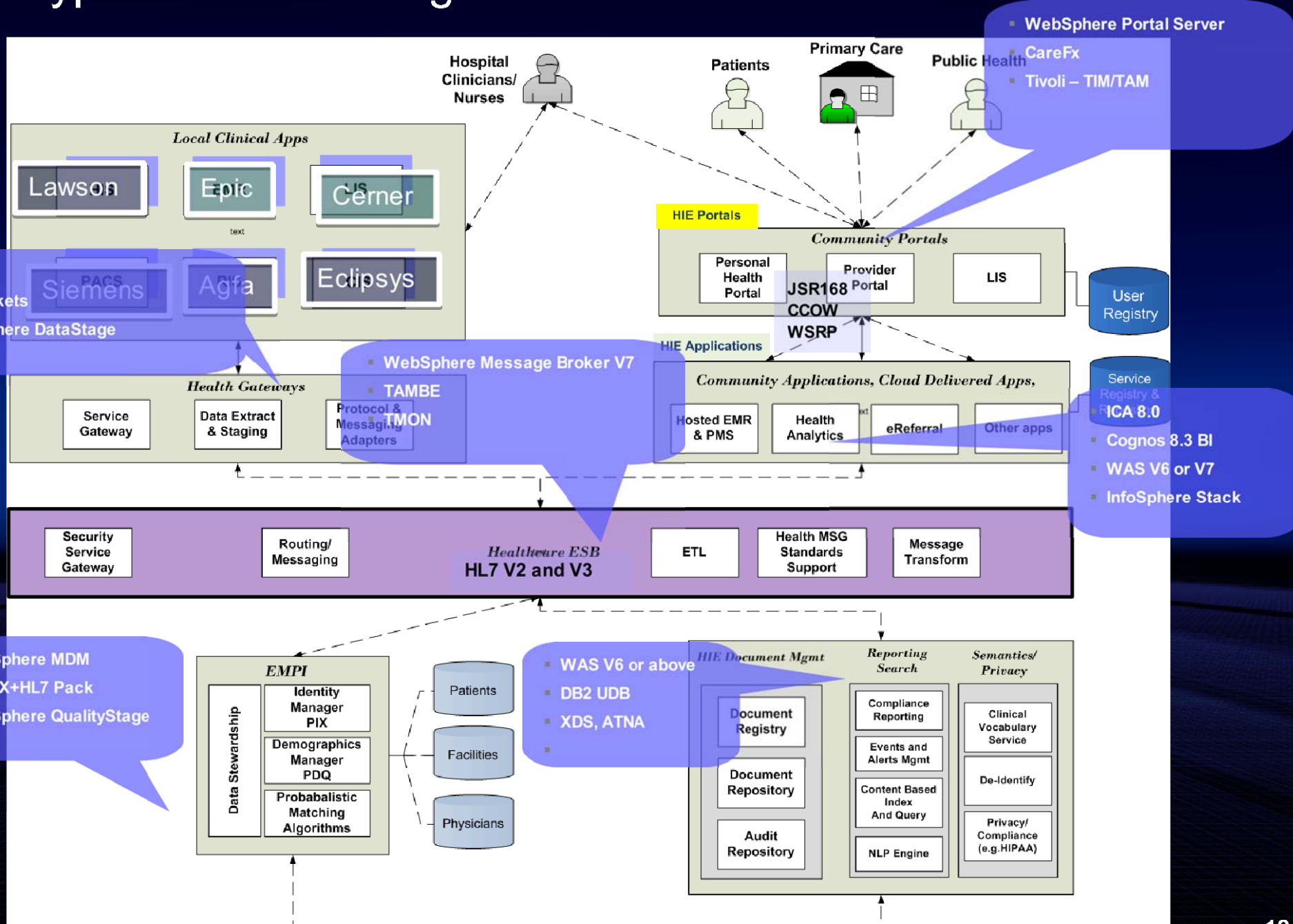
*Delivering ROI and Increasing Reuse With Each Project*

## Why a Framework for healthcare?

- Roadmap and reference architectures based on best practices
- Incremental development
- Easier integration with disparate applications
- Share critical clinical and operational information
- Service reuse across the organization
- Reduced maintenance and operational risk



# Typical Provider/Regional Reference Architecture





How to get there





# Information Agenda Guide for Healthcare

Use enterprise view of customer and BPM to optimize operational efficiency, sales and care delivery

Deliver multi-channel, real time customer information to self service channels

Increase effective clinical decision making

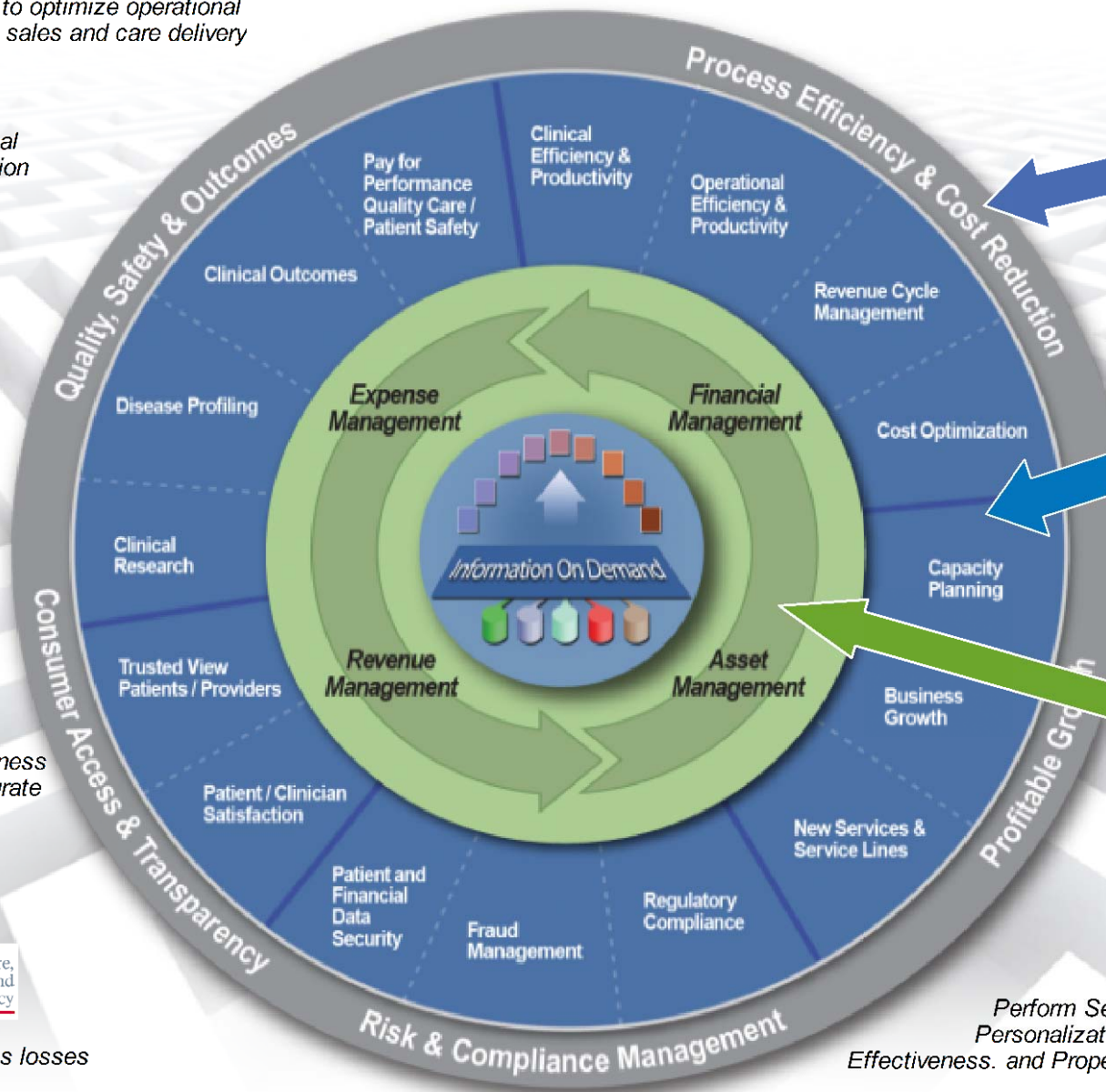


On-demand content archived, re-used and electronically accessible

Perform risk analysis and business performance reporting with accurate trustworthy information



Reduce fraudulent claims losses



**Strategic Imperatives**  
 The key focus areas for a specific industry that are critical to improving overall business performance

**Business Objectives**  
 The processes and activities that can be optimized through more effective use of information in support of the strategic imperatives

**Core Management Processes**  
 The underlying processes that are prevalent across all areas of the company in every industry and must be managed for improved business performance

Perform Segmentation, Personalization, Channel Effectiveness, and Propensity to Buy Analysis

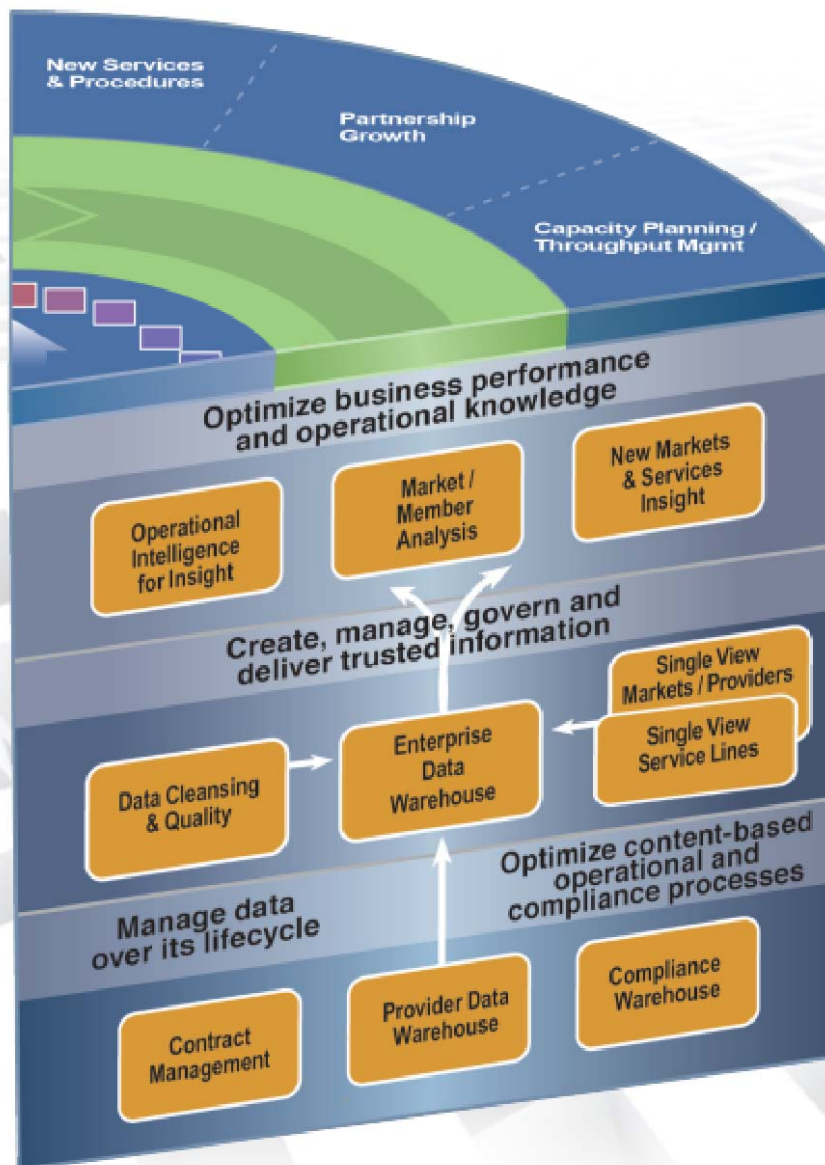


# Information Agenda Guide for Healthcare

## Profitable Growth



Business Optimization



### Large National Health System

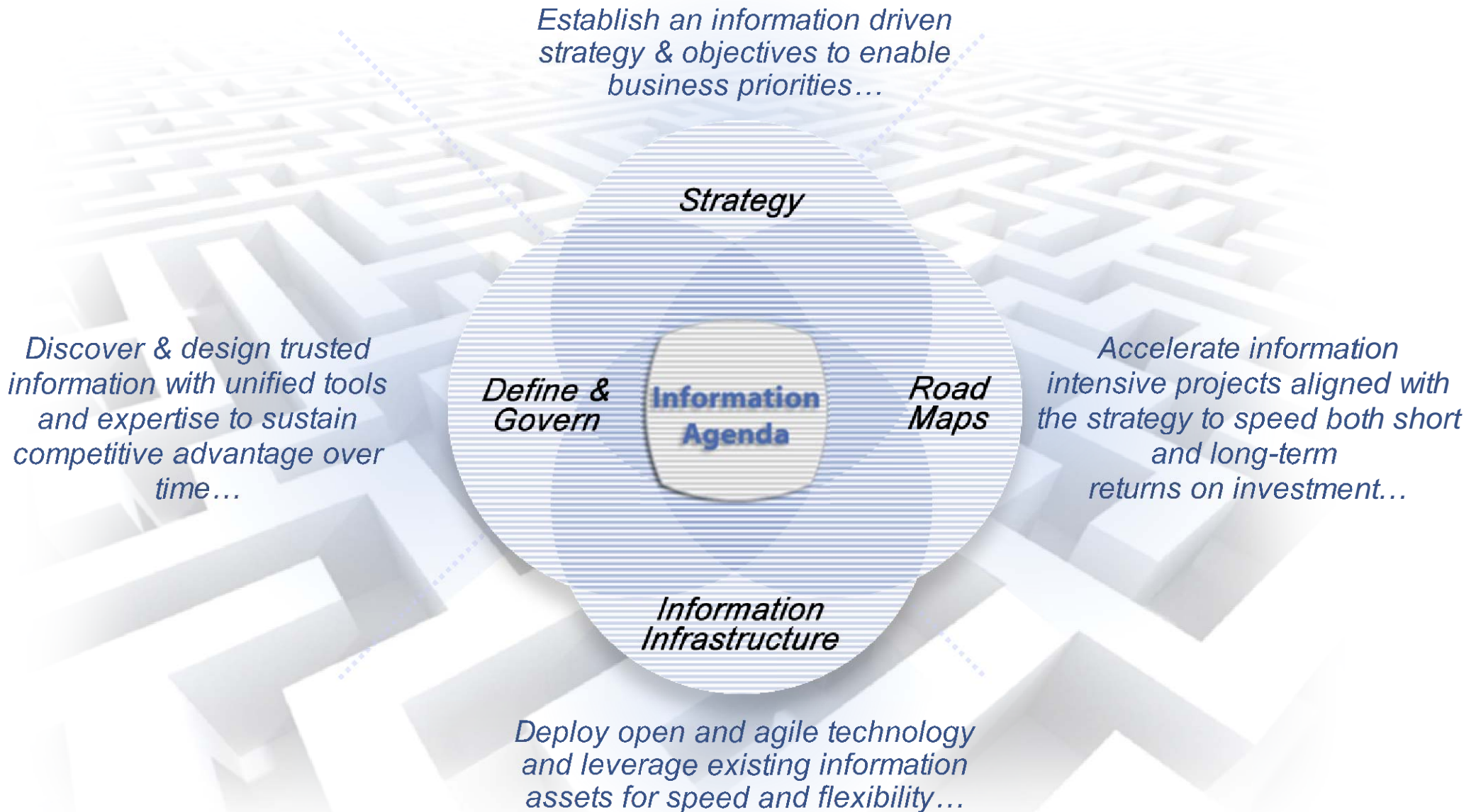
- ✓ Uses predictive analytics with imbedded data mining tooling for disease management
- ✓ Analyzes Chronic Kidney Disease data to predict clinician requirements and target interventions
- ✓ Provides early detection and control of epidemics.
- ✓ Reduces costs and accelerated medical solution development







## *Becoming an Information Based Enterprise...*







# Information on Demand Assessments & Workshops

## Accelerate the Development of Your Information Agenda Roadmap





# Information on Demand Self Assessment

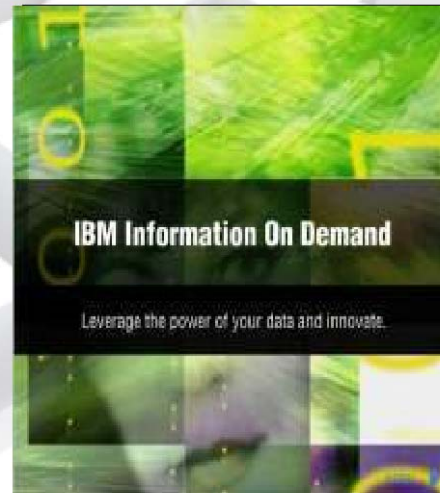


## Information Maturity Health Check

Contact [AskIOD@us.ibm.com](mailto:AskIOD@us.ibm.com)

		Maturity Levels					Assessment Criteria				
		Level 1	Level 2	Level 3	Level 4	Level 5	Technology	Data	Process	Culture	Organization
Information Maturity	Functional Areas						●	●	●	●	●
	Data Quality	Data Quality issues are typically discovered during testing or in production. A DQ assessment followed by a DQ plan is needed.					●	●	●	●	●
	Data Ownership	Data ownership is in silos. There is general agreement on data ownership areas. This needs to be formalized into an enterprise plan.					●	●	●	●	●
	Standards	Standards are within silos and across silos on an 'as needed' basis. Many point-to-point interfaces require more mapping than needed.					●	●	●	●	●
	Metadata	Metadata is generally passive and exists in requirements and test cases. Metadata needs to become more active and comprehensive.					●	●	●	●	●
	Metrics	Few metrics to measure the state of data in terms of volume, participation in messages, interfaces and business rules.					●	●	●	●	●
	Rules	Rules should be defined in terms of policy, process, procedure, methods and formulas. Need governance process for rules.					●	●	●	●	●
	Movement	Needed governance for replication / synchronization, archiving, participation in workflow. Data mediation complex needed.					●	●	●	●	●
Handling	Security is in place for key items. Retention periods need a more comprehensive approach. Need improved overall security processes.					●	●	●	●	●	

Sample Information Maturity Health Check



Take the Information On Demand self-assessment now to check your company's information maturity level and receive recommendations for improvement.....



# Information Agenda Customer Briefings & Workshops

## Customer Focused Sessions

	<b>Information Agenda Briefing</b>	<b>Roadmap Workshop</b>	<b>Business Solution Workshop / Pilot</b>
<b>Objective</b>	<i>Understand Value of Information Strategy</i>	<i>Build Vision and High Level Roadmap</i>	<i>Identify and Architect Initial Pilot</i>
<b>Duration</b>	Half - Full Day	3 – 6 Days	4 – 12 Weeks
<b>Deliverables</b>	<ul style="list-style-type: none"><li>▪ Industry best practices</li><li>▪ White Papers</li><li>▪ Business Value References</li></ul>	<ul style="list-style-type: none"><li>▪ Current State Analysis</li><li>▪ Business Goals &amp; Requirements</li><li>▪ Desired Technical Architecture</li><li>▪ Gap Analysis &amp; Roadmap</li><li>▪ Business Value Opportunities</li></ul>	<ul style="list-style-type: none"><li>▪ Pilot Identification</li><li>▪ Business Processes</li><li>▪ Technical Architecture</li><li>▪ Demos</li><li>▪ Business Case</li><li>▪ Implementation Plan</li><li>▪ Implementation Best Practices</li></ul>





# Information Agenda Roadmap Workshop

## Roadmap Workshop

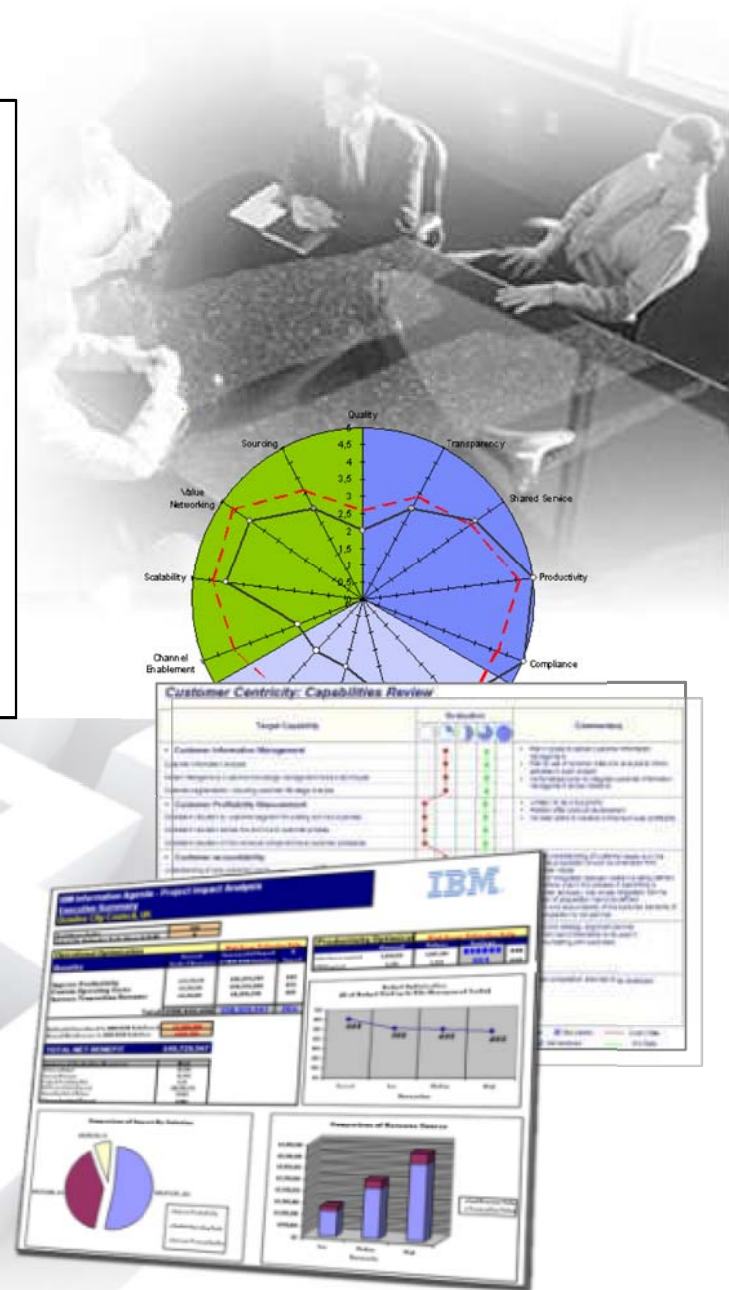
2-3 Day workshop to help build an Information Agenda Roadmap using a proven five-step approach:

### 5-Step Approach

1. Conduct Information Maturity Assessment
2. Document the Business Problem / Challenge
3. Identify Challenges and Opportunities for Improvement
4. Provide A Business Vision & Technology Requirements
5. Define the Business Value

## Benefits

- ✓ Helps prioritize tactical projects based upon business value
- ✓ Helps client identify best approach to solve tactical projects with industry leading capabilities – resulting in more successful implementation, tangible business results, and minimized risk
- ✓ Ties current IT initiatives to business value – with long term vision and strategy for leveraging information as a strategic asset





# Business Solution Pilot

## Architect an Initial Solution Project

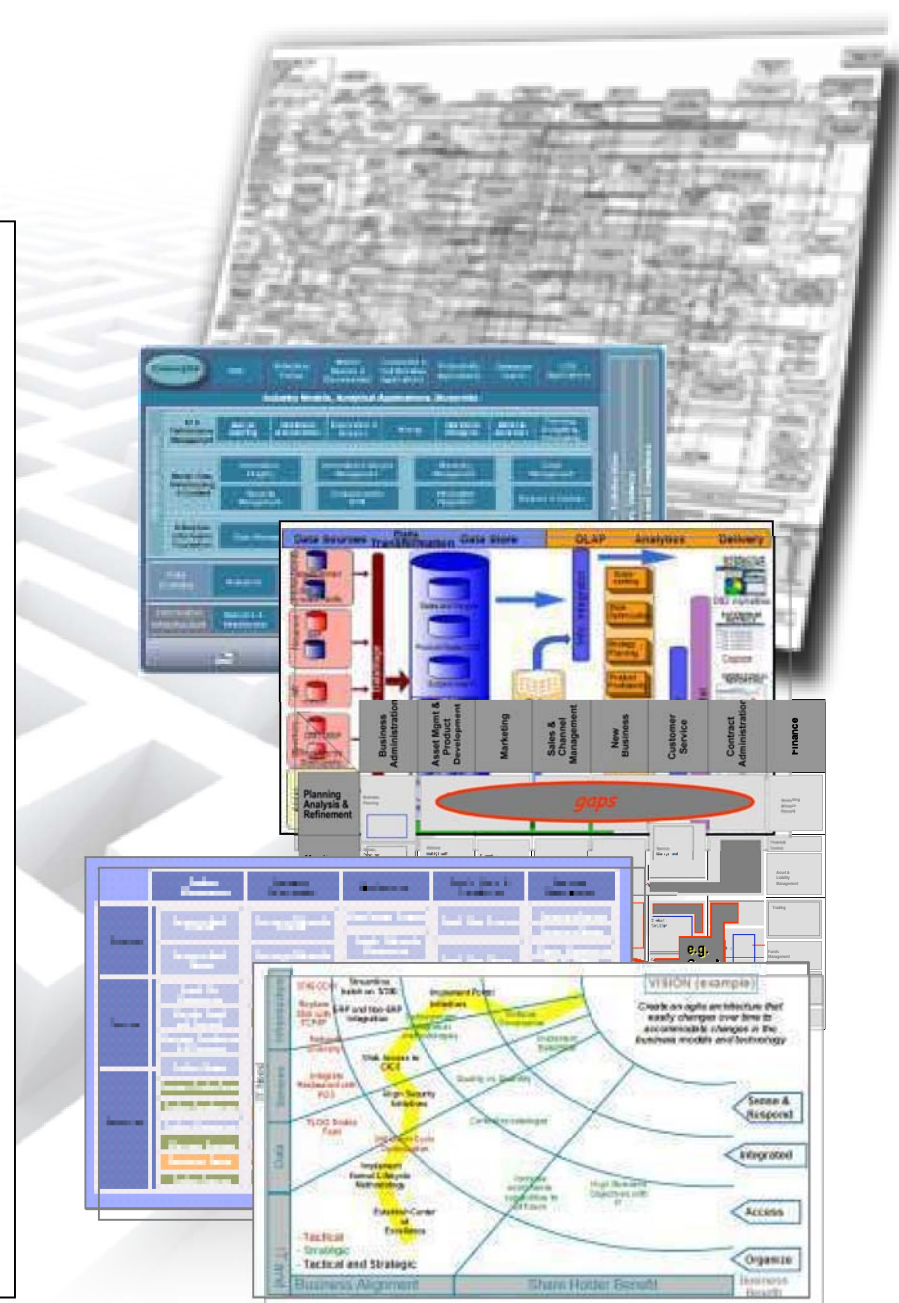
### Solution Pilot

- ✓ Create business case and high level plan for the first project to deliver business value in the near term

### Scope

1-4 Week project focused on developing a technical solution architecture and business value case. Typical activities include:

- ✓ Define Project
- ✓ Model Future State Solution Architecture
- ✓ Evaluate And Select Software
- ✓ Size And Scope Project
- ✓ Business Value Assessment

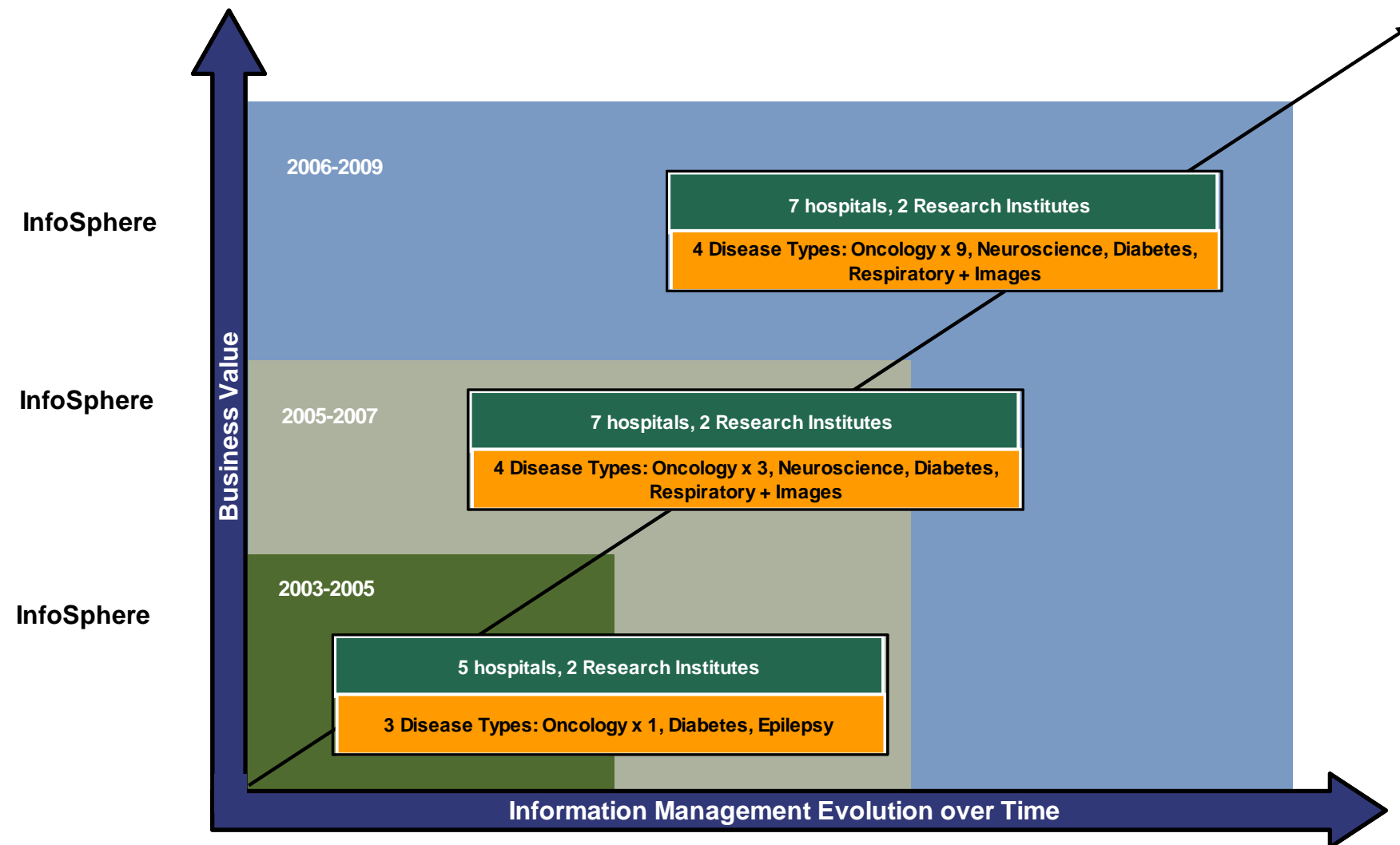




# Case Studies



# Melbourne Health's Molecular Medicine Information Model (MMIM) for next-generation clinical research leveraged IBM's Information Agenda technologies and IBM Global Services

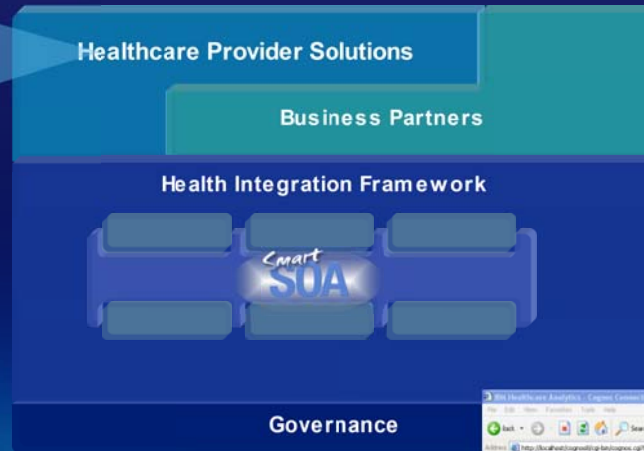




# Enterprise Health Analytics Solution Overview



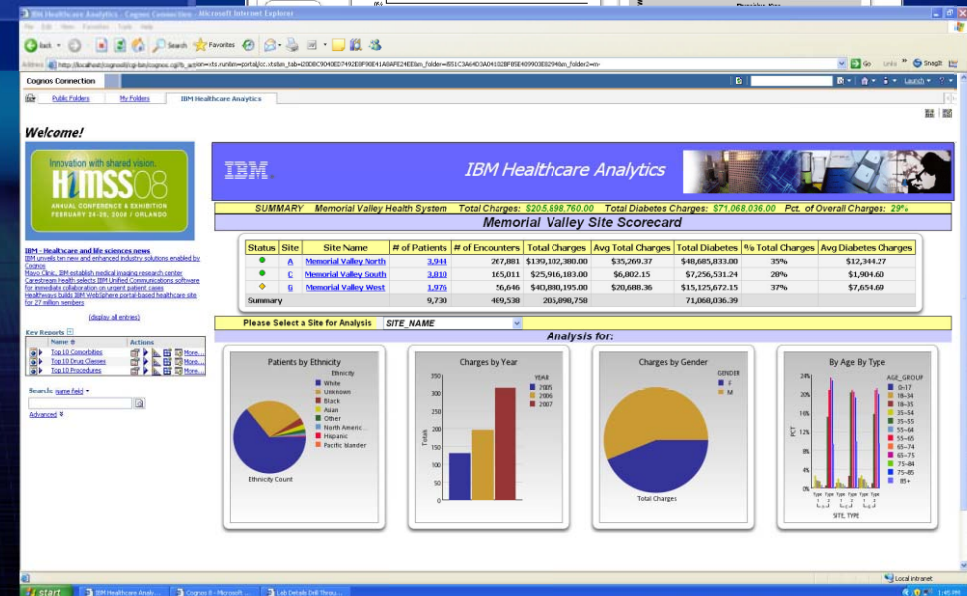
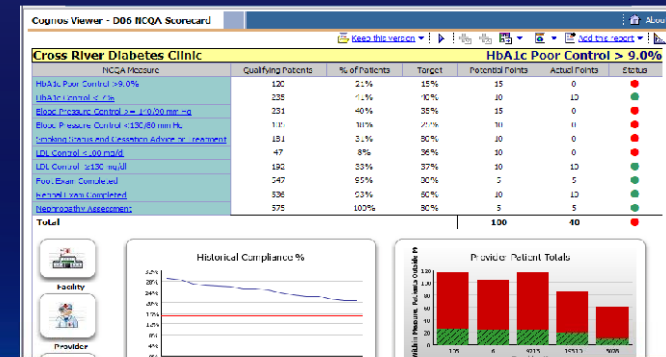
Enterprise Health Analytics



**Business Partners**

## Solution

- Enterprise data warehouse, tools and capabilities to aggregate and analyze data across the healthcare organization to improve clinical and business outcomes and results.
- Dashboards for patient safety, quality, research, and operations.



# Enterprise Health Analytics

## *On-Ramp Project: Geisinger Health System*



## GEISINGER

### Client Challenges

- Improving clinical insight to help identify clinical trends and best practices for better clinical care.
- Need to organize information and integrate real-time clinical data with medical history.

### Actions

- Built a Clinical Decision Intelligence System (CDIS) creating a foundation for integrating clinical, financial, operational, claims, genomic and other data.



### Benefits

- Consolidates information about injuries, illnesses and finance for a comprehensive patient view.
- Created a massive storehouse of clinical information, procedure and research, enabling rapid analysis and reporting to foster best-practice care.
- Enables extensive medical information to be used as the basis for research, treatments and life-saving breakthroughs.
- [Read more about this success story](#)



# Duke Medicine is transforming the way they communicate and interact with their patients



## Drivers

- Patient satisfaction and safety
- Operational efficiency
- Reduce costs
- Competitive advantage

## Smarter Business Outcomes:

- Provide patients access to their own health records - empowerment and transparency into their own care and health.
- Build deeper relationships between physicians and their patients through unified communications

## Why Smart SOA?

- Real-time multisystem, multivendor integration
- The Duke Healthview portal offers a single user interface for patients and physicians to access information from multiple applications and environments
- Reduced complexity in connecting to legacy custom-built and vendor-provided applications
- IT staff finds itself able to add the functionality faster than the users can absorb it\*





# Healthcare Integration and Interoperability

## On-Ramp Project: Trillium Health Centre



### Client Challenges

- Enable an integrated patient profile for each patient, that can be shared seamlessly from hospitals and doctors' offices to specialists and healthcare agencies.
- Instantly accessible, with appropriate security and privacy safeguards.

### Actions

- Trillium formed THINK - Transforming Healthcare into Integrated Networks of Knowledge – a strategic 7-year, \$100 million initiative to transform healthcare delivery.
- Fully integrate patient data across multiple points of care.
- Allow patients to add input to and manage their health record.
- Provide a fully integrated planning and scheduling process across the continuum of care.

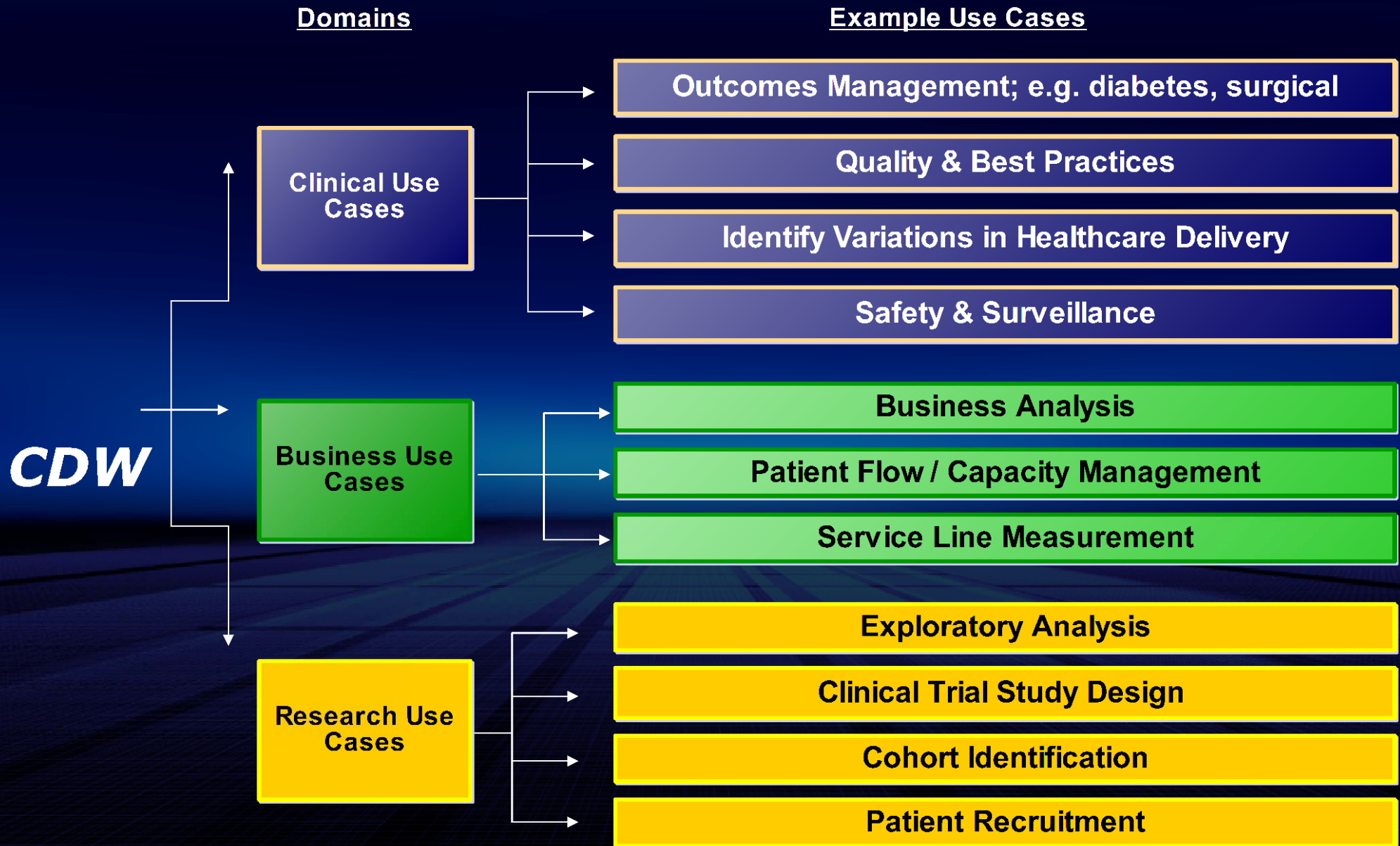


### Benefits

- Enhances the overall quality and safety of patient care and improves patient health outcomes
- Provides patients, clinicians and staff with a fully integrated knowledge and learning system available 24x7
- About 2 million transactions per week
- [Read more about this success story](#)



# Provider Enterprise Analysis Use Cases



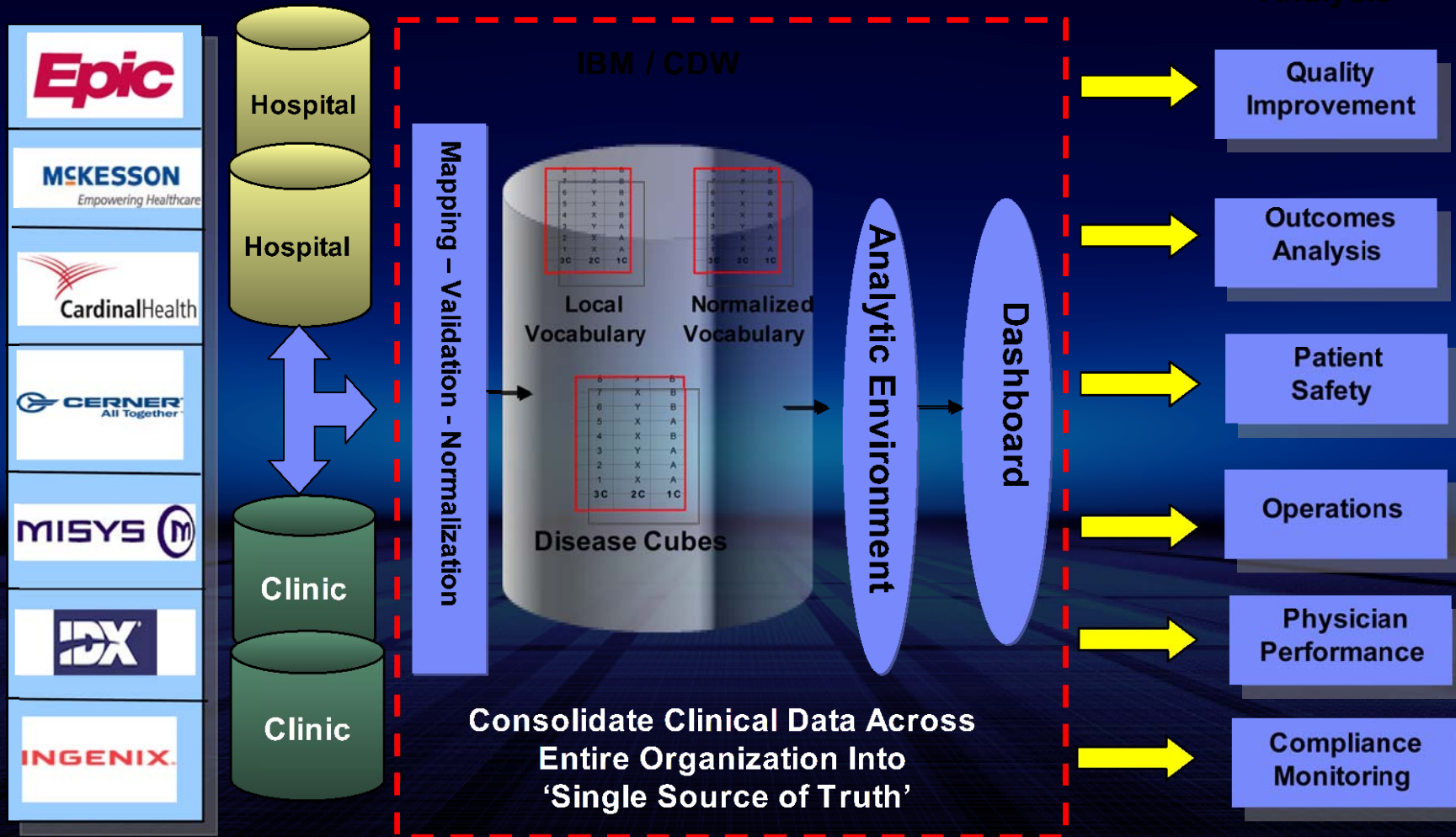
# Healthcare Provider Solutions Enterprise Health Analytics

Data Sources

Analysis

Separate Systems & Siloed Data

Care & Ops Improvement





Main Dashboard v1.2

[Patient Profile Dashboard](#)

[Patient Volume Dashboard](#)

[CCT Healthcare Analytics](#)

[Public Folders](#)



Valley Community Hospital



Healthcare Intelligence Dashboard

Powered by:



**IBM - Healthcare and life sciences news**

[UMDNJ-Robert Wood Johnson Medical School uses high performance IBM computer in pursuit of medical treatments](#)  
[IBM supercomputer bolsters cancer research](#)

[\(display all entries\)](#)

**Links**

- | Name   |
|--|
| <a href="#">1. Breast Cancer</a>             |
| <a href="#">2. Diabetes Management</a>       |
| <a href="#">3. CAC Dashboard</a>             |
| <a href="#">4. Child Post-Op</a>             |
| <a href="#">5. Patient Profile Dashboard</a> |
| <a href="#">6. Patient Volume Dashboard</a>  |
| <a href="#">7. Patient Query</a>             |

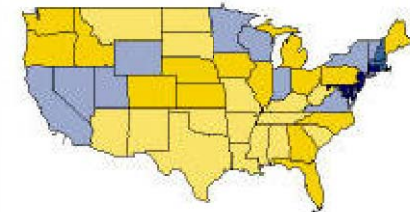
**Diagnosis Cube**

- | Name                               |
|------------------------------------|
| <a href="#">Click for Analysis</a> |

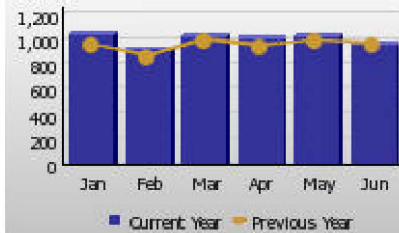
**SELECT QUALITY AND CORE MEASURES (HOSPITAL)**

Measure	Status	Trend	Current Month %	Previous Month %	Two Months Prior %	YTD %	Current Time Period
<a href="#">Antibiotic received w/in One Hour prior to Surgery</a>	■	▼	89.0%	92.5%	91.1%	90.9%	2006, 6
<a href="#">CABG</a> <a href="#">Colon</a> <a href="#">Hip Arthroplasty</a> <a href="#">Hysterectomy</a> <a href="#">Knee Arthroplasty</a> <a href="#">Other Cardiac</a> <a href="#">Vascular</a>							
<a href="#">Appropriate Antibiotic</a>	■	▼	95.7%	96.4%	94.0%	93.3%	2006, 6
<a href="#">CABG</a> <a href="#">Colon</a> <a href="#">Hip Arthroplasty</a> <a href="#">Hysterectomy</a> <a href="#">Knee Arthroplasty</a> <a href="#">Other Cardiac</a> <a href="#">Vascular</a>							

**National Demographic Map**



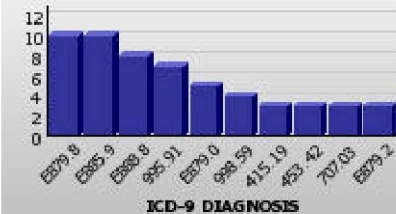
**Admissions**



**Readmissions**



**Top Clinical Conditions During Stay**

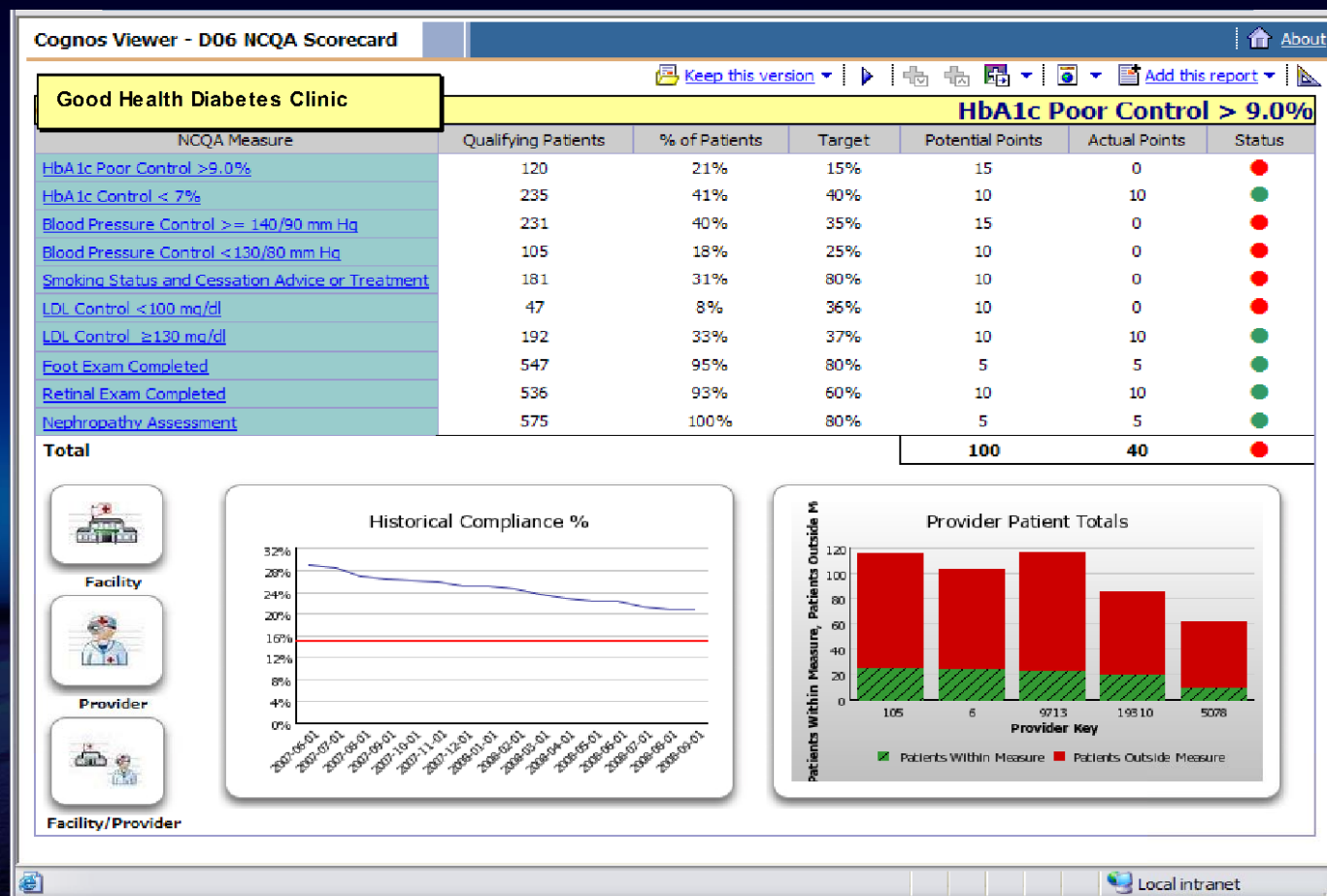




# Cross River Program

A reference Implementation of IBM's Health Analytics Platform

- Premier test harness, product showcase, and center of excellence at the IBM Dallas Global Solutions Center
- Proof point for integrating all essential components for an enterprise class health analytics platform (integration, analytics, presentation layer)



A Scorecard for NCQA Diabetes Measures