

# **FOSS: Better Health Care Through Collaborative, Evidence Based, Software Evolution**

*Joseph Dal Molin  
President, WorldVistA*

*OSHCA 2007  
Kuala Lumpur, May 8, 2007*

# Agenda

---

- Why FOSS in healthcare
- Evidence
- Issues and Challenges
- Conference Overview and Expectations Discussion

# Chronic Symptoms of

---

- Aggregate cost of health systems is too high: Canada, UK
- Difficult to share medical information and integrate systems despite many years of top down standardization efforts
- Difficult to measure effectiveness of health policies and investment in information technology
- Re-invention of the wheel is a pandemic
- Legacy software business and development models are poor dance partners in “evidence based” health improvement
- The “human” opportunity cost of legacy health ICT business and technology transfer models has become too large and obvious to ignore

# National Implementation Comparisons

## Similar Scenarios

## Investment

## Reach

## Achievements



### United States of America

**Served population:** 295,000,000<sup>1</sup>  
**Impl. due date:** 2014<sup>2</sup>  
**Est. investment:** 600 BUSD<sup>3</sup>



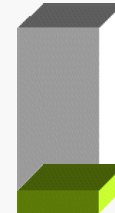
### United Kingdom: NHS

**Served population:** 60,400,000<sup>1</sup>  
**Impl. Due date:** 2010<sup>4</sup>  
**Est. investment:** 20 BUSD<sup>5</sup>



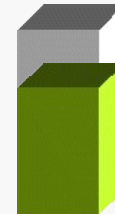
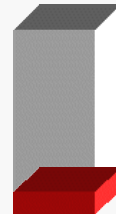
### Canada: Canada Health Infoway Inc.

**Served population:** 16,400,000<sup>1</sup> & <sup>6</sup>  
**Impl. due date:** 2009<sup>6</sup>  
**Est. investment:** 1.3 BUSD<sup>7</sup>



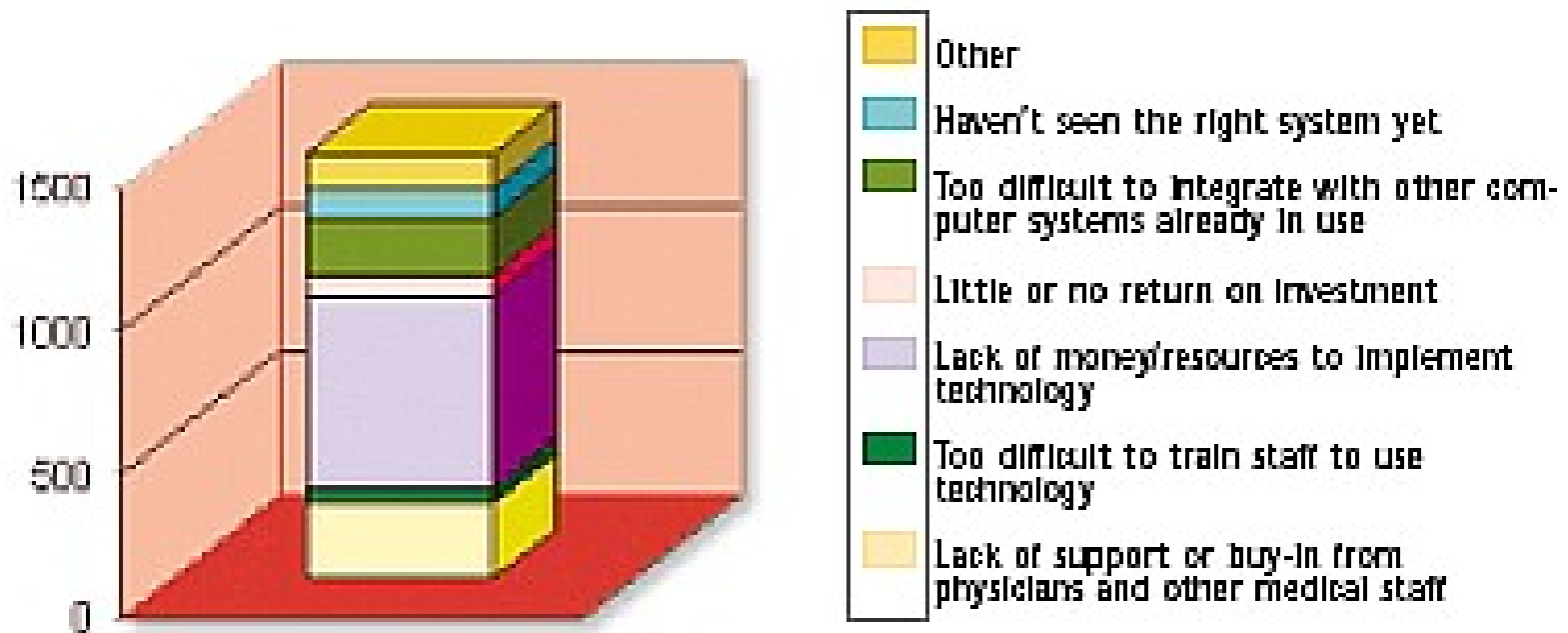
### IMSS

**Served population:** 46,813,307  
**Impl. due date:** 2006  
**Est. investment:** 102 MUSD



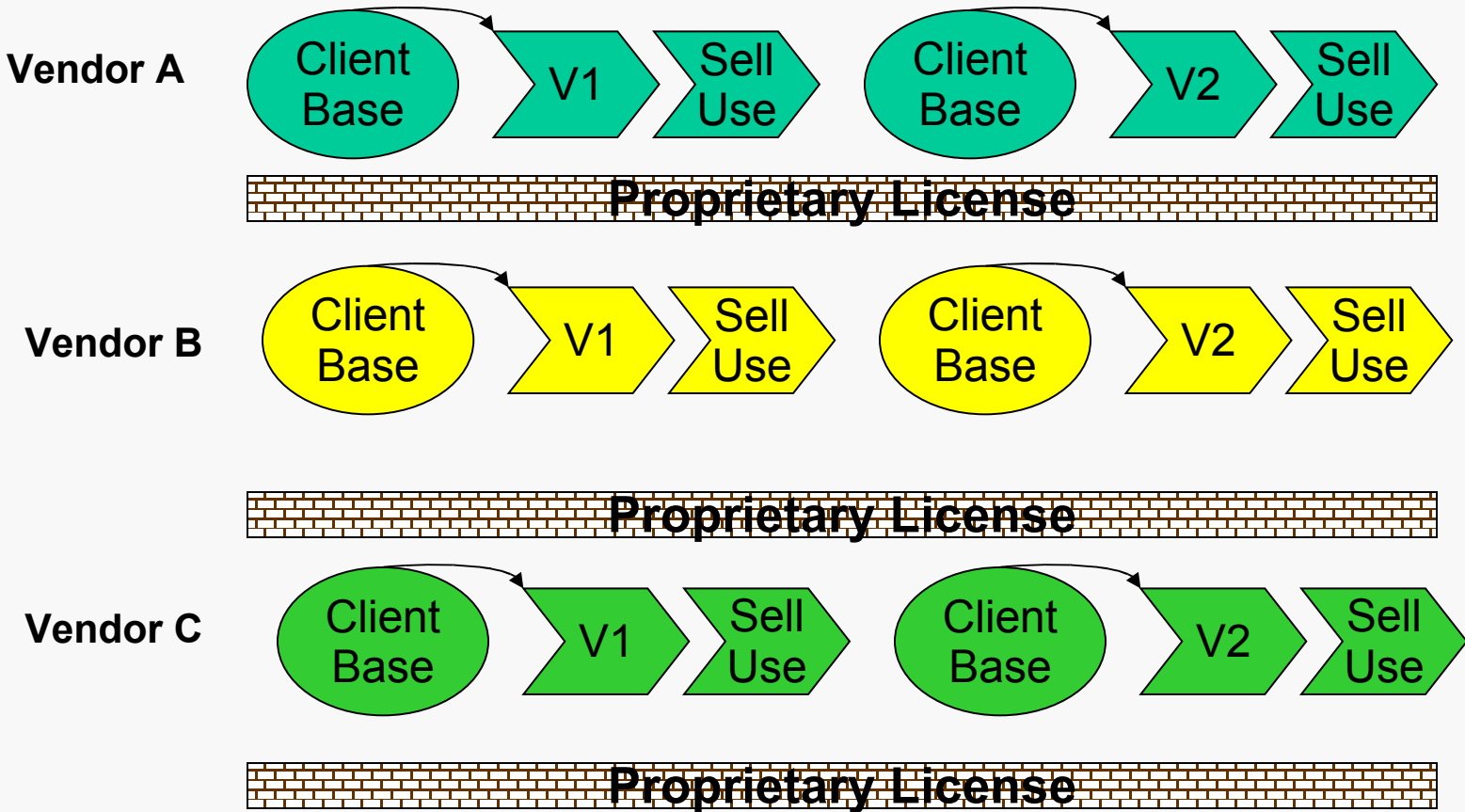
# Symptoms

## Obstacles to Implementing Technology



2004 ACPE Health Care Technology Survey

# Legacy Software Innovation Process

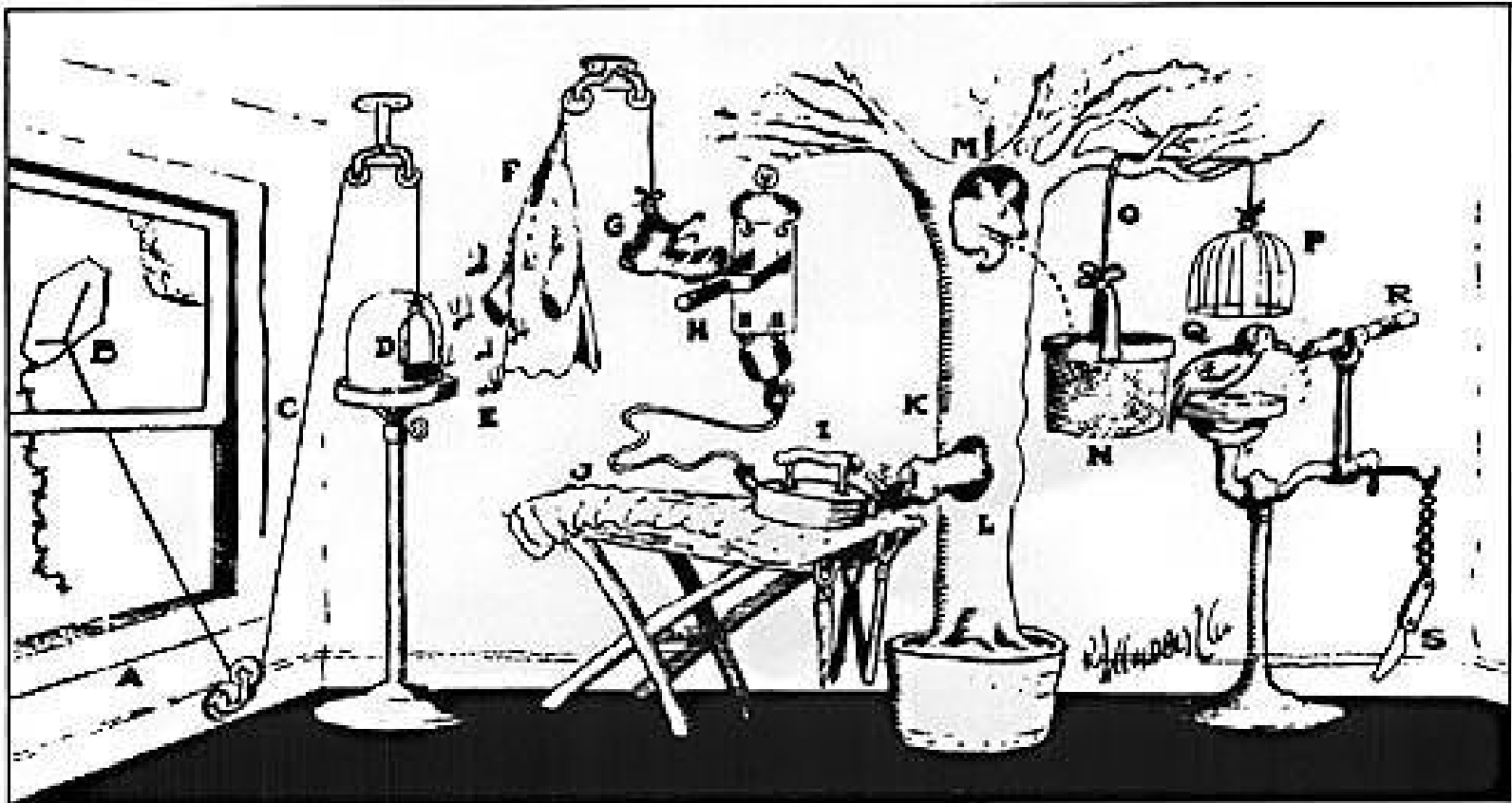


# Legacy Software Innovation Process

---

- Cross pollination very limited and slow
- Me Too Strategy - reinvention of wheels
- Limited by R&D budgets, intellectual capital, listening skills and market surface area
- Releases timed to maximize ROI
- Survival of the “fittest” does not always apply, other factors such as marketing and customer lock-in may dominate

# Building an Integrated National Health ICT Infrastructure in a Proprietary World



Pencil Sharpener RUBE GOLDBERG (tm) RGI 038

# Why the Legacy Software Industry Model is a Poor Fit for the Health Sector

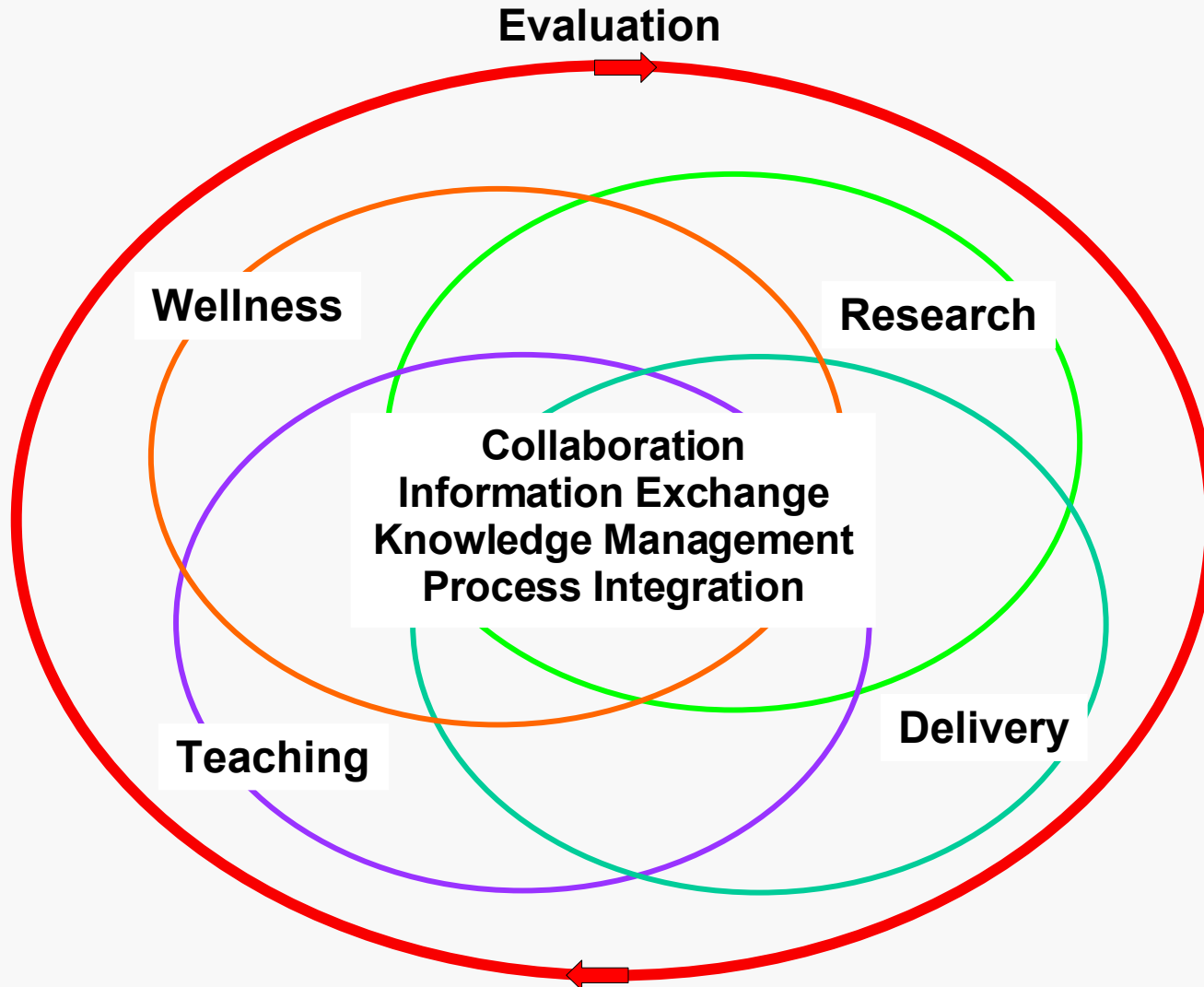
---

*Health systems are “ecosystems” NOT “industries”*

- Health systems are complex adaptive systems
- They look chaotic on the surface
- Behaviour in health systems is unpredictable, non-linear
- Relationships are complex and fluid
- No two stakeholders are identical
- Health systems do not respond well to “top down” command and control models and culture, common in “industry”
- New thinking is needed

# Health Systems are Complex Adaptive Systems

---



# It Is Time for a New Paradigm

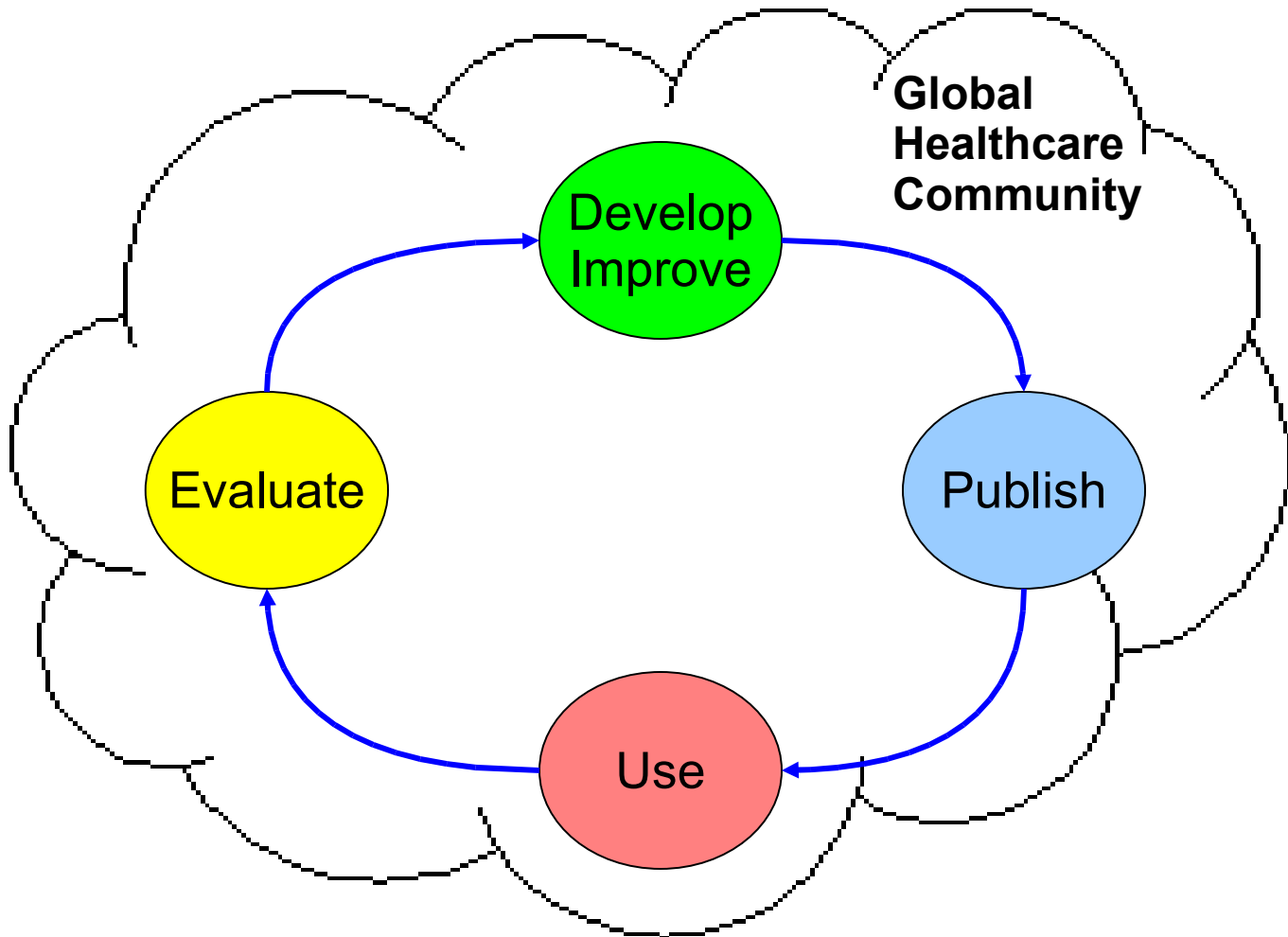
---

"The significant problems we face cannot be solved at the same level of thinking we were at when we created them."

*Albert Einstein*

# The Open Source Model

---



# Comparing FOSS With Legacy Strategies

## Similar Scenarios

## Investment

## Reach

## Achievements



### United States of America

**Served population:** 295,000,000<sup>1</sup>  
**Impl. due date:** 2014<sup>2</sup>  
**Est. investment:** 600 BUSD<sup>3</sup>



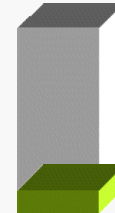
### United Kingdom: NHS

**Served population:** 60,400,000<sup>1</sup>  
**Impl. Due date:** 2010<sup>4</sup>  
**Est. investment:** 20 BUSD<sup>5</sup>



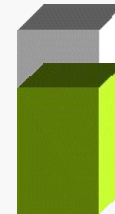
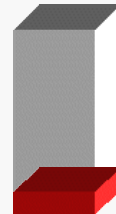
### Canada: Canada Health Infoway Inc.

**Served population:** 16,400,000<sup>1</sup> & <sup>6</sup>  
**Impl. due date:** 2009<sup>6</sup>  
**Est. investment:** 1.3 BUSD<sup>7</sup>



### IMSS

**Served population:** 46,813,307  
**Impl. due date:** 2006  
**Est. investment:** 102 MUSD



# Health Systems Based on Open Collaboration Can Outperform Other Models

**Table 2.** VA, Medicare, and Best Measured non-VA, non-Medicare Performance for 18 Comparable Performance Quality Indicators (US benchmarks are bolded)\*

Clinical Indicator	VA 2003	Medicare 2003 <sup>14</sup>	Best non-VA or Medicare
Advised tobacco cessation (VA x3, others x1)	75	63	68 <sup>17,t</sup>
Beta-blocker after MI	98	93	94 <sup>17,t</sup>
Breast cancer screening	84	74	75 <sup>17,t</sup>
Cervical cancer screening	90	NA	81 <sup>17,t</sup>
Cholesterol screening (all patients)	91	NA	73 <sup>18</sup>
Cholesterol screening (post-MI)	94	80	79 <sup>17,t</sup>
LDL-C < 130 mg/dL post-MI	78	67	61 <sup>17,t</sup>
Colorectal cancer screening	67	50	49 <sup>18</sup>
Diabetes HbA <sub>1c</sub> checked past year	94	88	83 <sup>17,t</sup>
Diabetes HbA <sub>1c</sub> > 9.5% (lower is better)	15	NA	34 <sup>17,t</sup>
Diabetes LDL-C measured	95	91	85 <sup>17,t</sup>
Diabetes LDL-C < 130 mg/dL	77	68	55 <sup>17,t</sup>
Diabetes eye exam	75	65	52 <sup>17,t</sup>
Diabetes kidney function	70	54	52 <sup>17,t</sup>
Hypertension: BP ≤ 140/90	68	61	58 <sup>17,t</sup>
Influenza immunization	76	74	68 <sup>16,s</sup>
Pneumococcal immunization	90	NA	63 <sup>18</sup>
Mental health follow-up 30 days postdischarge	77	60	74 <sup>17,t</sup>

\*All measures are directly comparable, except for mental health follow-up, because the VA accepts telephonic follow-up. All data are from 2002 and were published by the sources noted.

BP indicates blood pressure; HbA<sub>1c</sub>, glycosylated hemoglobin; LDL-C, low-density lipoprotein cholesterol; MI, myocardial infarction; NA, data not available; VA, Department of Veterans Affairs.

<sup>t</sup>Patients were of all ages and were in private managed care programs.

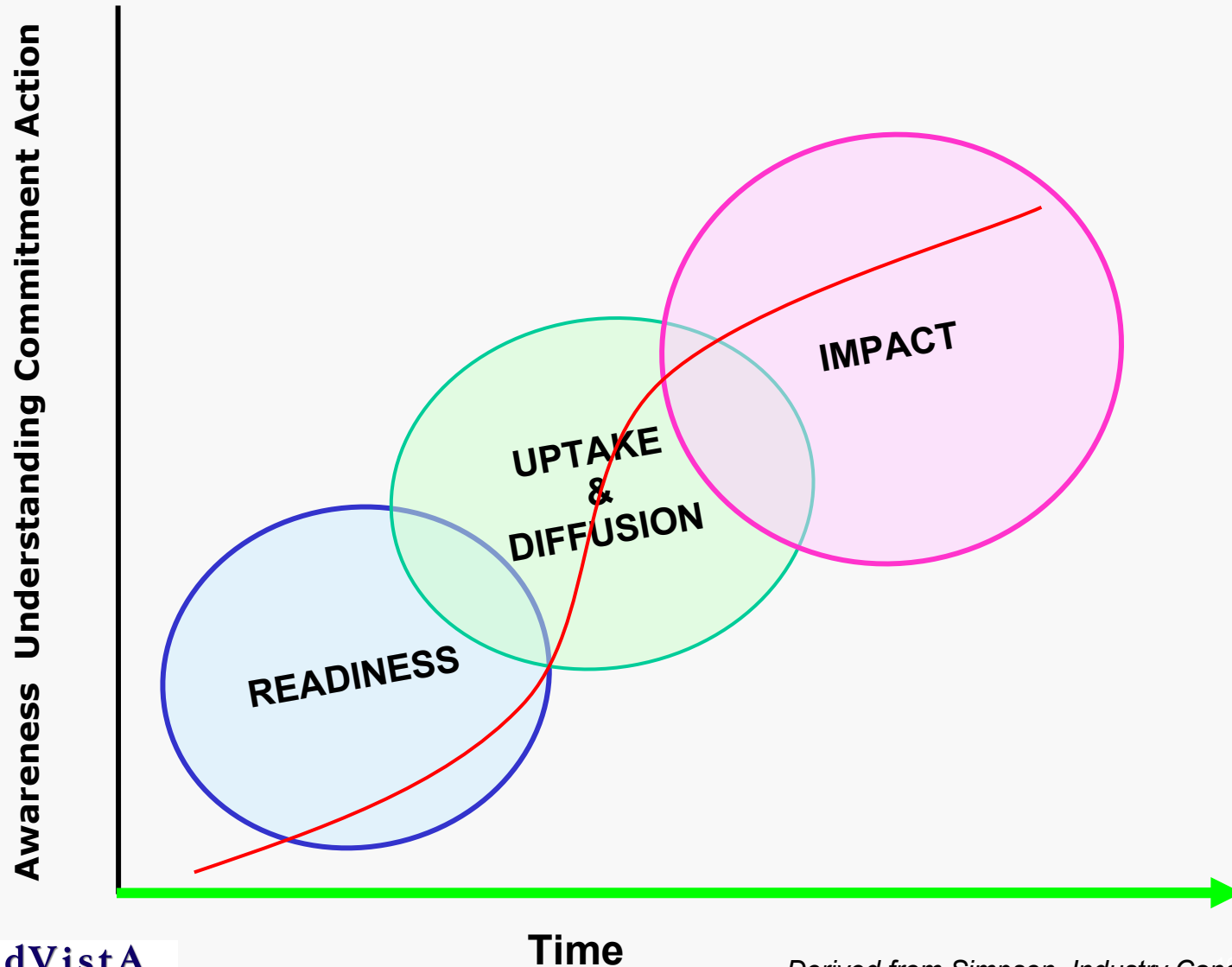
<sup>s</sup>Rhode Island is the benchmark for influenza immunization.

# OSS A Path of Least Resistance for Technology Transfer and International Collaboration

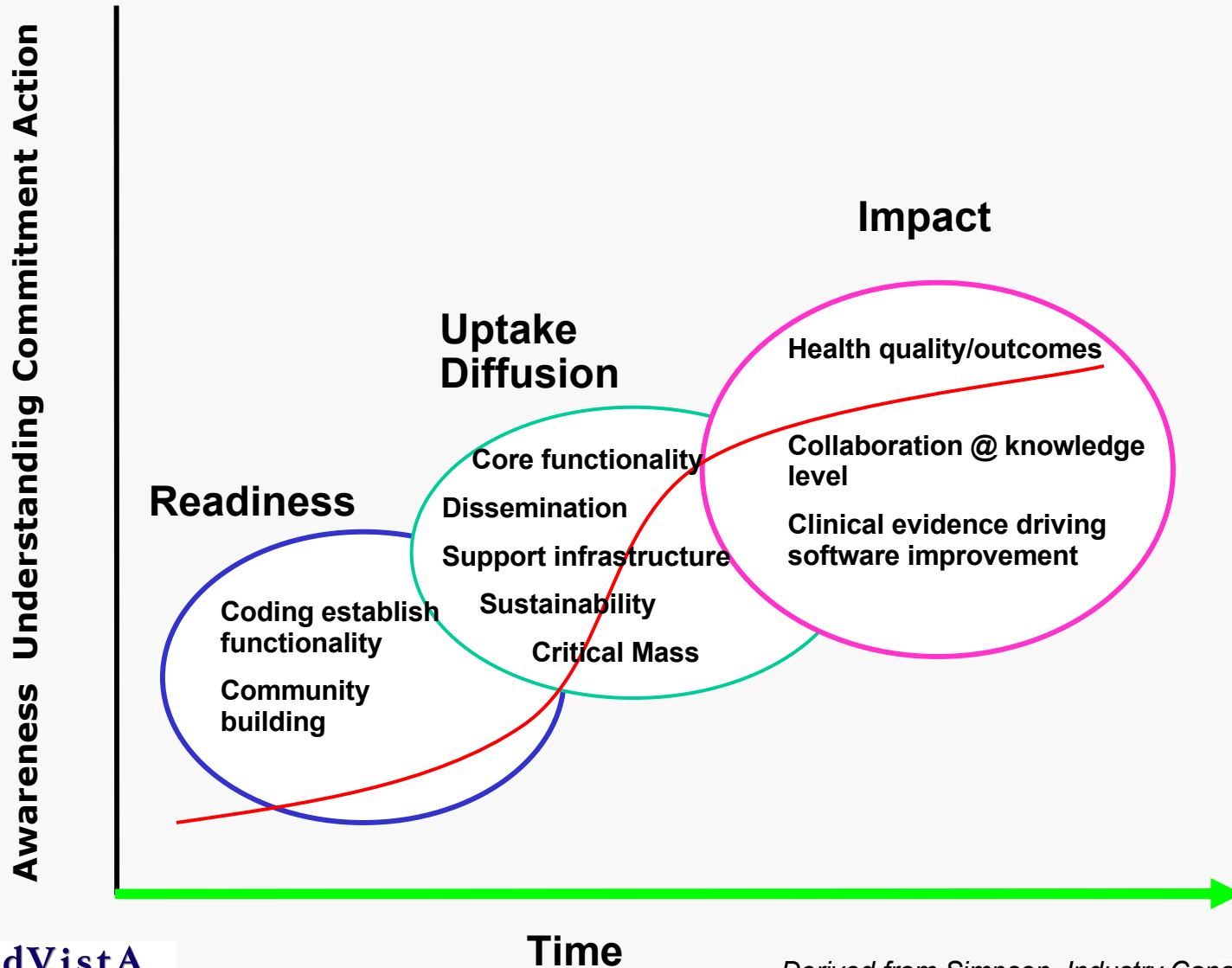
---

- You can start small
- Leverages investment of the global community
- Rapid, Cumulative Innovation
- Naturally leads to standardization
- Fewer to no intellectual property issues
- Goes beyond addressing “Digital Divide” issues
- Enables better focus on clinical outcomes

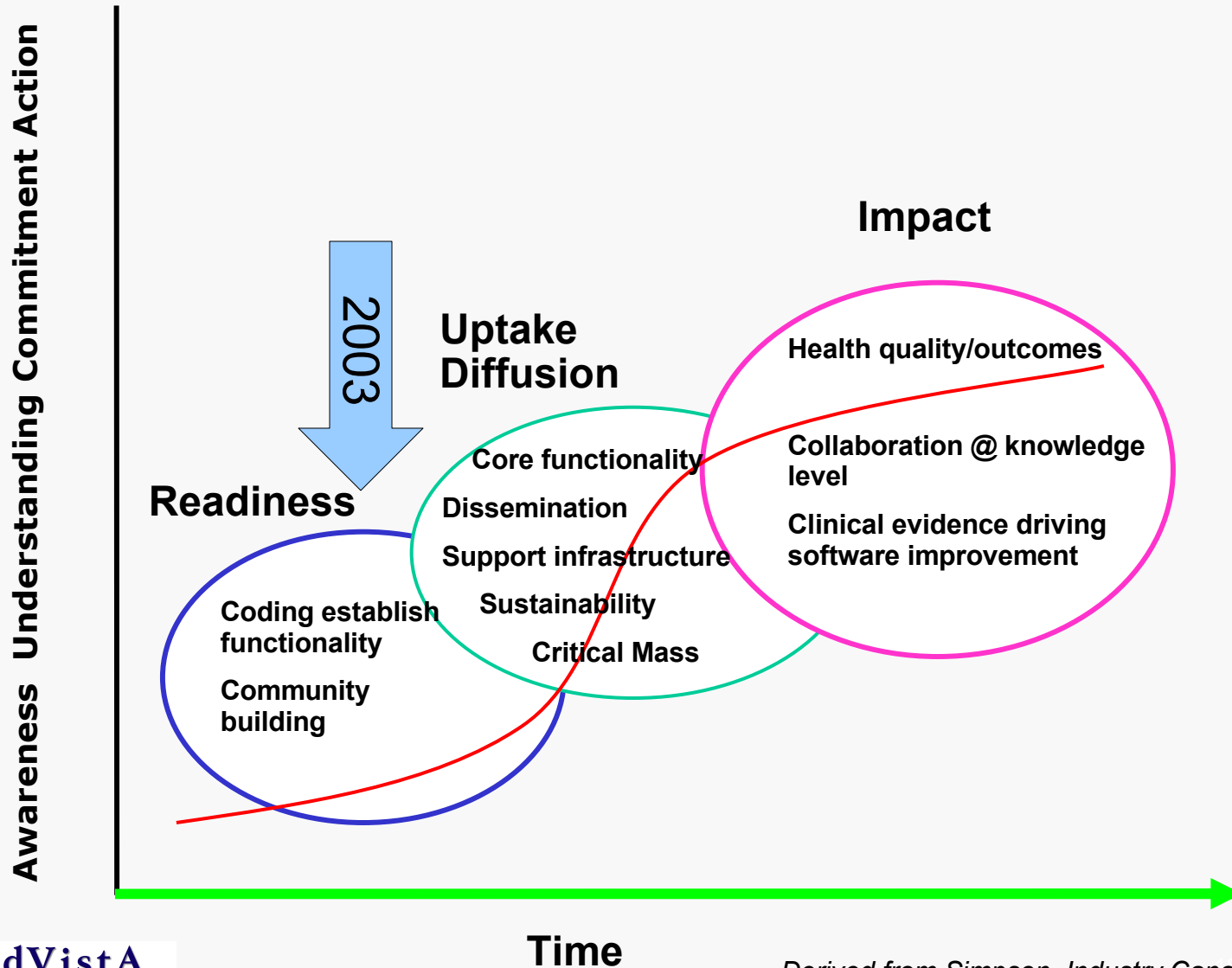
# Technology Transfer Process Model



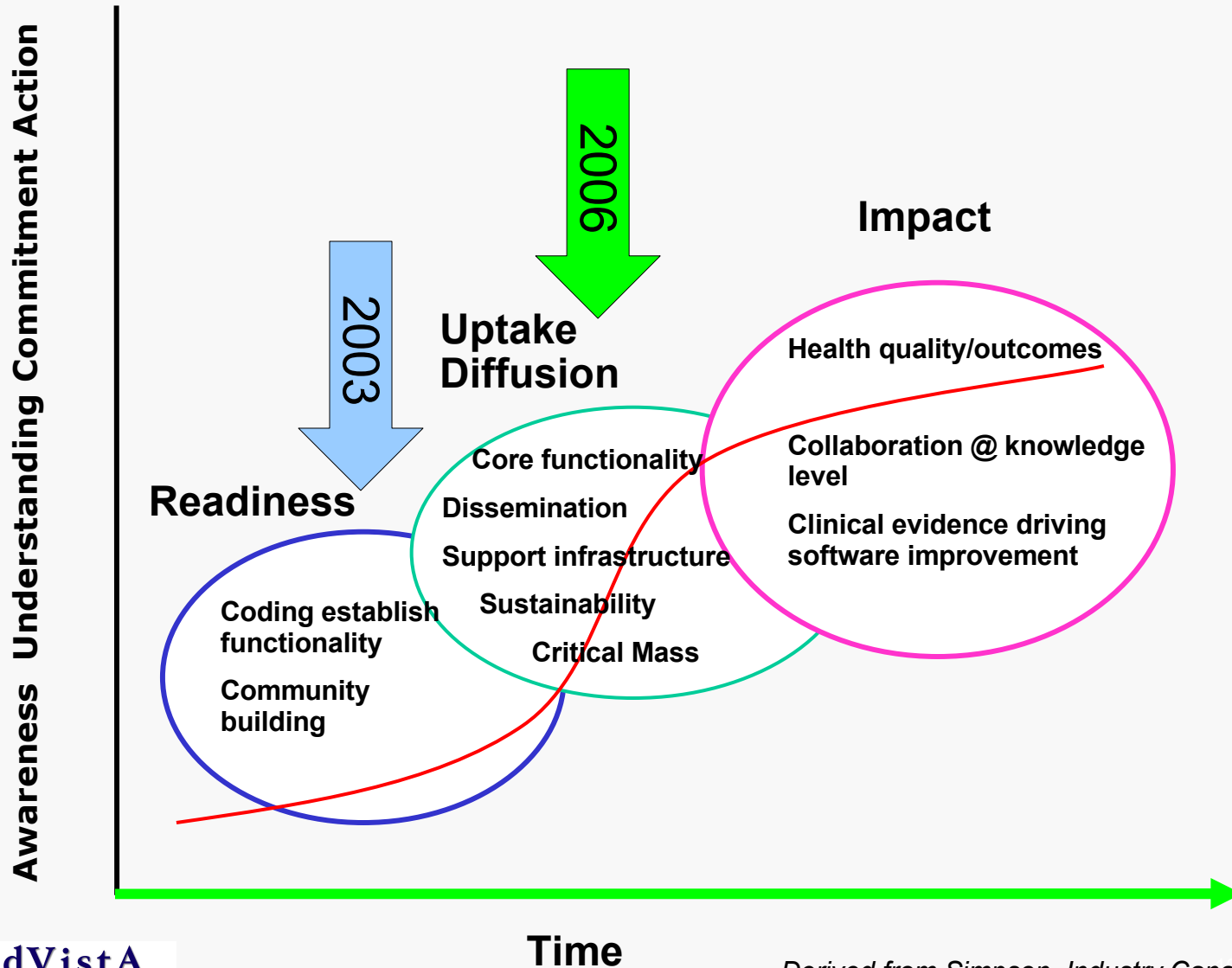
# Open Source Maturity



# Open Source Maturity



# Open Source Maturity



# Challenges

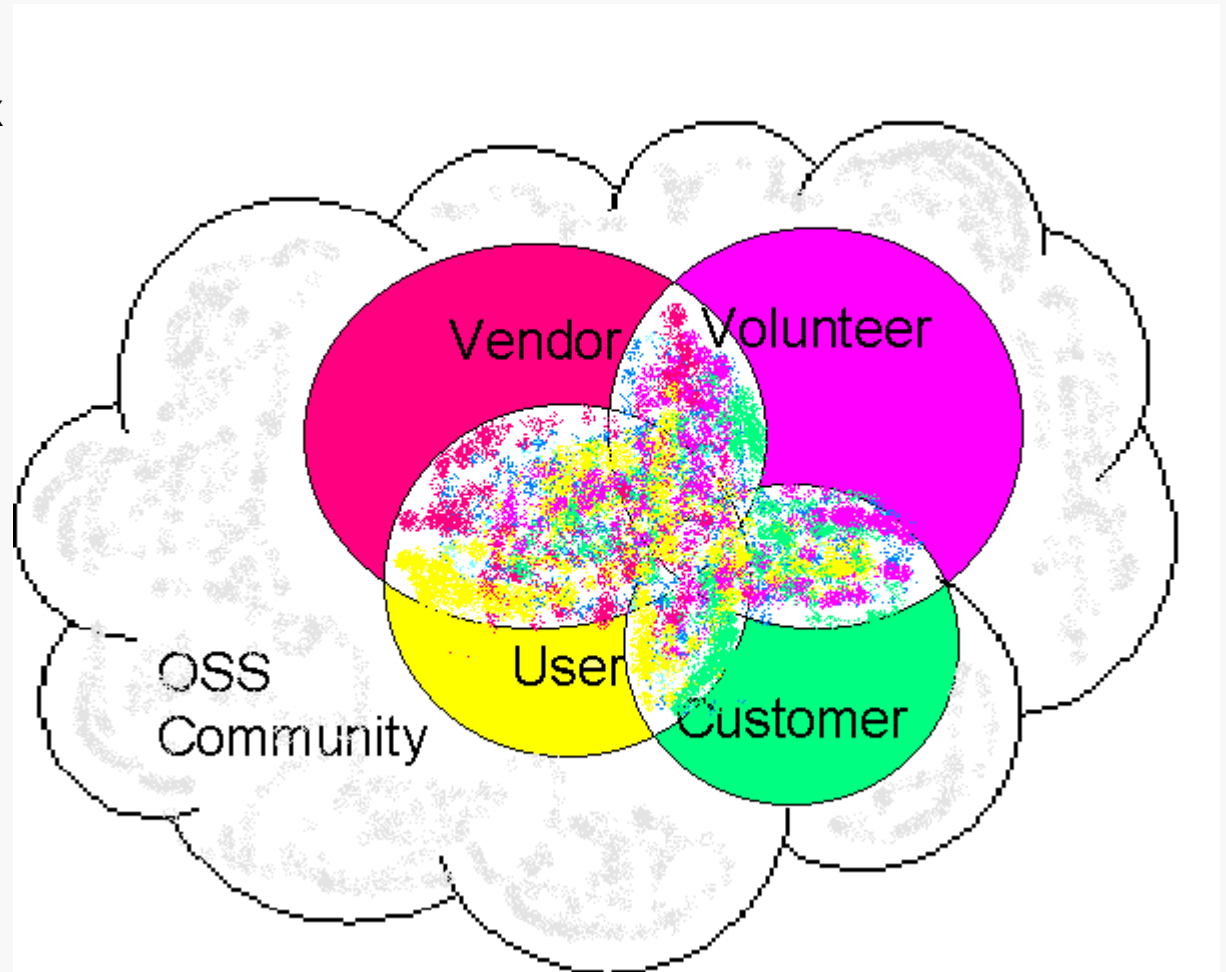
---

- Procurement processes
- Localization without forking
- Predictable, sustainable funding beyond development
- Limited bandwidth for collaboration
- Identifying the best opportunities for collaboration
  - eg. Knowledge base standardization – drug data bases, laboratory test, terminology
- Funding to support effective collaboration
- NIH – not invented here (it's too complex, it isn't on the right platform, it comes from a different health system)

# It is a Heterogeneous Community

---

The business of open source is socially complex there are multiple overlapping roles played by buyers, vendors, suppliers, developers, consumers, and volunteers.



# Issues to Consider

---

- Emergence of the consumer as a key strategic driver
- Adopting a system wide bottom up strategy
- Embedding capture of health outcomes data in applications
- Ability to evolve policy in step with rapidly evolving technology and business practices
- Understanding of the “systemic” business case
- Software integration and interoperability between legacy systems
- Cultural adaptation and localization

# Areas to Consider

---

- Acquisition Models
- Capacity Building for Deployment and Support
- Implementation - Collaborate with others who have done it
- Enhancement - Leveraging global community investment

# Thank You!

---

“There's only one thing more painful than learning from experience, and that is not learning from experience.”

*Author Unknown*

# OSHCA 2007 Program Overview

---

- Day 1
  - Plenary – FOSS Concepts and Status
  - FOSS Applications & Projects
  - FOSS Concepts
  - FOSS Business Concepts
- Day 2
  - Plenary – Interoperability and Standards
  - Interoperability & Standards
  - FOSS Applications & Projects
  - Workshops

# OSHCA 2007 Program Overview

---

- Day 3
  - Plenary – Trends in Healthcare Informatics Technology
  - FOSS Applications & Projects
  - Workshops
- Day 4
  - Health Eco-system, OSHCA and YOU
    - Get to know OSHCA
    - How to move FOSS agenda to mainstream
    - Role of FOSS in health agenda for sustainable development
    - Organizing the community within and without
    - Working together with funders and programs
  - Developer Training

# Expectations

---

- Our expectations
  - “Interoperate”, network and make new friends
  - Ask questions.... take advantage of those with experience
  - Have fun
- What are your expectations?