Data Liberation: The New Frontier In Healthcare IT

Event-Driven Healthcare
Gary Ferguson, PhD
Chief Healthcare Strategist
TIM BERNERS-LEE

http://www.ted.com/talks/tim_berners_lee_on_the_next_web.html
WHAT DIDN’T TIMBERNERS-LEE KNOW?
It’s Not AOL

• A place called Amazon.com
  – On line marketplace
• People would do on-line banking
  – On line transactions
• Use face book to keep in touch with family and friends
  – Social communications
Manohar Aich
Mr. Universe, 1952
“I think there is a world market for maybe five computers.”

1943
“640K ought to be enough for anybody.”

1981
“During my service in the United States Congress, I took the initiative in creating the Internet.”

1986
“If Gore invented the Internet, I invented spell-check.”

1992
“Where is all the knowledge we lost with information?”

T.S. Elliott
“The best way to predict the future is to create it”

Peter Drucker
NOT EVERYTHING HAPPENS AS PREDICTED

Missouri vs. Norfolk State
Duke vs. Lehigh
South Florida vs. Temple
Norfolk State
Lehigh
Temple
DATA IS THE NEW BOTTOM LINE
MASTER TRENDS SHAPING THE 21ST CENTURY

Healthcare Response Still Lags

EXPLOSION OF DATA
- 2.9 million
- Number of e-mail sent out every second

MOBILITY
- 37.5
- Data consumed by households every day

SOCIAL PLATFORMS
- 20
- Video uploaded to YouTube every minute

MATH TRUMPING SCIENCE
- 24 petabytes
- Data per day processed by Google
- 110 photos
- Picture uploaded on Flickr every second
- 17 accounts
- New LinkedIn accounts every second
- 50 million
- Tweets per day
- 700 billion
- Total minutes spent on Facebook each month
- 1.3 exabytes
- Data sent and received by mobile Internet users
- 72
- Products ordered on Amazon per second

Still Lags

MATH TRUMPING SCIENCE

SOCIAL PLATFORMS

MOBILITY

EXPLOSION OF DATA

TIBCO
Through collaboration and competition and following decades of failures by researchers, gamers with no domain expertise were able to help solve one of the greatest mysteries in science within 3 weeks, the mutant retroviral HIV/AIDS protease.
2012 Healthcare spend around $3 Trillion, 18% of GDP with an estimated minimum waste of 20%
STOPPING AT **STAGE 1** MEANINGFUL USE REQUIREMENTS WON’T GET YOU WHERE YOU NEED TO GO.

**BEYOND 2015**

**TRANSFORMED HEALTHCARE**

- **Enhanced ability to study care delivery and payment systems**
- **Empowered individuals & transparency**
- **Improved care, efficiency, and population health outcomes**

**2011-2012**
- Data Capture & Sharing
  - **2012** Shared Savings Value-based Purchasing Hospital Readmission Reduction

**2013-2014**
- Demonstrate Health System Improvement
  - **2013** Bundled Payment Pilots
  - **2014** Payment Reductions for Hospital-acquired Conditions

**2015**
- Transform Healthcare & Population Health through Health IT
  - **2015** Meaningful Use Penalties
  - **Data Capture & Sharing**

Information from “Federal Health Information Technology Strategic Plan 2011-2015” made available by ONC on 3/24/110
NOW THAT WE HAVE IT, WHAT DO WE DO WITH IT?

- Changing requirements for data
- Data available in real time
- Viewing data information in multiple contexts
- Velocity and variability and volume
- Expensive
- Interoperability

CAPTURE DATA

80% Unstructured
90% Not Collected

UNDERSTAND DATA

ACTIONABLE DATA
INTEROPERABILITY
It is a Journey, Not a Destination

- **Stage 1 - Meaningful Use**
  - Electronic records captured
  - Moving electronic records

- **Stage 2 – Meaningful Use**
  - Single standard for transitions in care
  - Single standard for lab interfaces
  - Secure eMail exchange (NHIN Direct specifications or secure encrypted SMTP)

- **Framework**
  - Meaning
  - Structure
  - Content
  - Transport
WHY DATA LIBERATION HAS BEEN SLOW

- Privacy and Security Regulations
- Competitive Differentiation
- Ill-informed Consumer
- Hard To Separate Data From Applications
- Profusion Of Datasets
- Ineffective Analytics And Dashboards
- Meaningful Is Not Actionable
- Point Of Care/Decision Making
“Healthcare data breach results in $1.5 million settlement – the predicament for providers and patients in Stage 2 meaningful use”
INTEROPERABILITY – IT’S A TWO-WAY STREET

Technology Alone Won’t Improve Patient Engagement

• Physicians need patient information and need to cede control
  – 50% of Doctors don’t use Internet tools to improve care
  – 1 in 5 Doctors provide on-line access to labs and appointments

• Patients must be willing to share sensitive PHI
  – Patients twice as likely to do on line banking
  – Only 1 in 9 patients are interested in PHR services

   ⭐ 40% of patients don’t want PHI shared
       3 in 5 patients interested in using wireless devices to share data
THE GAME CHANGER
Complex Event Processing

- Significant events in the event cloud
- Analyze impact and react in real time
- Event pattern detection and correlation
- Reveal unknown-knowns
- Integrated with BPM for CBI
  - Business awareness
  - Technology
A little bit of the right information, just a little bit beforehand — whether it is a couple of seconds, minutes or hours — is more valuable than all of the information in the world six months later ...
Ensures that returns follow outcomes

PREDICTIVE models that enable earlier intervention

Uses technology for providing PERSONALIZED care

Facilitates rapid and accurate diagnoses

PREVENTS redundant or conflicting treatments

Ensures that returns follow outcomes

Shares data across systems for real time PARTICIPATION

Improved Outcomes and Reduced Cost of Care.

TIBCO
CURRENT STATE
• Patients navigate unassisted across different provider and care settings
• Lack of coordination and communication leads to no accountability, medical errors, waste and duplication (especially labs and diagnostics)
• Today, high cost intervention produces higher returns than primary care, prevention and clinical management of chronic diseases

Transformation Needs:
• Empowered individuals & transparency
• Improved care, efficiency, & population health outcomes
• Enhanced ability to study care delivery & payment systems

IDEAL STATE
• Patients have easy access to information
• Patient’s clinical data available to all providers at the point of care through EMR
• Patient care coordinated among multiple providers and transitions of care settings
• All providers on the care team collaborate to deliver high quality, high value care
• Clear accountability for total care of patient
WHAT SHOULD HEALTHCARE LOOK LIKE?

Healthcare is the only industry where repeat business is bad business.
“The traditional payer value chain faces increasing commoditization. Winning health plans will become consumer centric organizations on par with the best retail companies ...”

Vishal Agrawal, McKensey
HEALTH INSURERS MUST BECOME SOCIAL-FOCUSED RETAIL GIANTS

Posted on March 20, 2012 by Dr Gary Ferguson | Leave a comment

Retail Giant

Engage Consumers

Health Advocates

Socially Connect

http://successfulworkplace.com/
DECISION SUPPORT AT THE POINT OF CARE

Detection-Oriented CEP Makes it Possible
CHANGE BEHAVIOR
Look at Things Differently

FedEx
CONTINUOUS IMPROVEMENT VS. DISRUPTIVE CHANGE

<table>
<thead>
<tr>
<th>Year</th>
<th>Stock Price</th>
<th>Market Cap</th>
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<tbody>
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<td>2002</td>
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<tr>
<td>2012</td>
<td>$530</td>
<td>$493B</td>
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</table>

- 80% New Music Ecosystems
- 20% Legacy Publishing Ecosystems
- 100% Legacy Telecom Ecosystems
- 95% Legacy Ecosystem
# TRANSFORMATIVE GROWTH

## Vulnerable Ecosystems

<table>
<thead>
<tr>
<th>Innovator</th>
<th>Create or Displace</th>
<th>Impacted Ecosystem</th>
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</thead>
<tbody>
<tr>
<td>Ford Model T</td>
<td>Create &amp; Displace</td>
<td>Personal Transportation / Horses</td>
</tr>
<tr>
<td>Google Search / Adwords</td>
<td>Displace</td>
<td>Demand Fulfillment Advertising</td>
</tr>
<tr>
<td>Microsoft</td>
<td>Create</td>
<td>Personal Productivity</td>
</tr>
<tr>
<td>Apple iPod</td>
<td>Displace</td>
<td>Music Retailers</td>
</tr>
<tr>
<td>Netflix</td>
<td>Displace</td>
<td>Video Rental &amp; Retail (Cable TV too?)</td>
</tr>
<tr>
<td>Facebook</td>
<td>Create &amp; Displace</td>
<td>Social Network Platform &amp; Brand/Demand Creation Advertising</td>
</tr>
<tr>
<td>Google, AMEX, Wallmart, WebMD</td>
<td>Displace</td>
<td>Traditional Health Plans from Wholesale to Retail</td>
</tr>
</tbody>
</table>
OUT WITH THE OLD - IN WITH THE NEW
A Case For Complex Event Processing

Care Management

Direct to Consumer
Network Management
Business Optimization
CARE IS THE NEW CORE
Health Plans Rebrand and Go Social

Direct to Consumer
Health & Wellness
Differentiate Outcomes
Payment Incentive Alignment
ACO / P4P

Telehealth & Telemedicine
Consumer Portal
Provider Portal
EHR, HIE
Social Networking
Communications, Alerts
Analytics
Case Management Utilization

TIBCO
ON DEMAND LOYALTY PROGRAMS
Essential Ingredients

Complex Business Events

- Offers
- Relevant
- Real-time Engage
- Customer Insight
- Analytics

Patient

- Social Context
- Great Service
- Useful Mobility
- Patient Single View

Tibbr

BPM

Messaging

MDM
Event Driven Healthcare
The Ability to Predict Future Events and Proactively Intervene

SO, HOW DO WE GET THERE?
EVENT DRIVEN HEALTHCARE CAPABILITY MATURITY MODEL

A Road Map for Time-Value Paced Implementation

Optimal Priority Sequence

Connect
Authenticate
Optimize
Operationalize
Socialize

Optimal Priority Sequence
CUSTOMER ALERTS AND NOTIFICATIONS

- Did not pick up medication
- No discharge summary
- No PCP appointment requested
- Early refill requested
- Called after-hours service
- Claims denial
Social Media To Create Digital Identities

Driving Brand Identity

• Deliver greater value than portals and websites
  – Types of interactions
  – Relationship multiplier
• 80% of businesses use SMM’ers to market and manage
• Investment in MLR
  – Connecting with people internally (B2B) and externally (B2C)
  – Reacting to customer complaints or opportunities
  – Monitoring member chatter
  – Communicating with co-workers
  – Engaging in health, wellness, measurements, outcomes
• Maximizing return on targeted marketing spend
• ? Facebook, U-Tube, Twitter?
SOCIAL NETWORKING
COLLABORATION
LIFE STREAM INTEGRATION

- Facebook
  - TIBCO
  - Released December 12, 2010

- LinkedIn
  - TIBCO
  - Released December 12, 2010

- RSS Client
  - TIBCO
  - Released December 12, 2010

- Twitter
  - TIBCO
  - Released December 12, 2010
UNIFIED COMMUNICATIONS
If we get the **RIGHT INFORMATION**
to the **RIGHT PLACE**,  
at the **RIGHT TIME**  
and put it in the **RIGHT CONTEXT**

**WE can make the WORLD A BETTER PLACE.**
A FEW EXTRA SLIDES

Mobile Content
WHY MOBILE?

HDTV large: 24.6°
HDTV medium: 21.6°
Notebook: 21.9°
Tablet: 22.0°
Smartphone: 9.2°
WHY MOBILE NOW?
Convenience & Speed

- Affordable smart phones and tablets
- Pervasive connectivity and faster bandwidth (3G, 4G)
- GEO centric apps can engage patients
- Display as designed – no re-rendering
- Improved experience UI with touch screen UIs
- Security to protect PHI from unauthorized access
- Healthcare apps for anytime, anywhere real time alerts
Comprehensive solutions will involve a broad ecosystems of participants, including payers, healthcare providers, government and non–government organizations (NGO’s).
CONNECTED HEALTH DEVICES

**INSTRUMENTED**
Communicate & Interact
- Capture data to deliver preventative care
- Sensors recognize physical changes

**INTERCONNECTED**
Measure, Sense & See
- Integrate data and analytics for coordinated care and better decisions
- Real-time monitoring PHRs

**INTELLIGENT**
Respond, Predict, Optimize for Future Events
- Analyze data for multiple devices for recommendations
- Analytics to compare, track and alert