Maturity Models as a Foundation for Preparing for Population Health

Heart of America HIMSS Education Event
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HIMSS Analytics
HIMSS Analytics...

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Intelligence
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Three Key Elements for Successful Population Health Management
Information-powered clinical decision-making
- Use robust patient data sets to support proactive, comprehensive care
- Operate within an integrated data network
- Position a leader to merge data analytics with clinical care

Primary care-led clinical workforce
- Elevate PCP to “CEO” of care team
- Mobilize community workforce to extend care team reach

Patient engagement and community integration
- Map services to population need
- Overcome non-clinical barriers to maximize health outcomes
- Integrate patient’s values into the care plan
- Use community stakeholders to connect patients with high-value resources
Key Population Health Focus Areas
HIMSS Analytics Maturity Models

EMRAME & Ambulatory EMRAME
Continuity of CareSM
DELTA Powered™
HIMSS Analytics Maturity Models support Population Health Management

1. **EMRAM Adoption Model**\(^{SM}\) over a decade in healthcare
   - Well established, refined and accepted
   - Foundation for EMR and core technologies

2. **DELTA Powered™ Analytics Maturity Model** launched at HIMSS12
   - Analytics maturity industry standard model
   - DELTA Powered Suite of tools

3. **Continuity of Care**\(^{SM}\) **Model** launched at HIMSS13
   - International model
   - Aimed at bringing coordinated care and patient engagement
HIMSS Analytics EMRAM Model™

• HIMSS Analytics devised the EMRAM to allow the industry to track the progress of adopting applications in the EMR environment.
  – 8-stage model

• Hospitals can gain their EMRAM score by completing their study profile in the HIMSS Analytics® Database.

• For more information about the HIMSS Analytics EMRAM model, please visit: http://www.himssanalytics.org/emram/index.aspx
## US EMR Adoption Model℠

<table>
<thead>
<tr>
<th>Stage</th>
<th>Cumulative Capabilities</th>
<th>Q4 2011</th>
<th>Q4 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stage 7</strong></td>
<td>Complete EMR, CCD transactions to share data; Data warehousing; Data continuity with ED, ambulatory, OP</td>
<td>1.2%</td>
<td>2.9%</td>
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<tr>
<td><strong>Stage 6</strong></td>
<td>Physician documentation (structured templates), full CDSS (variance &amp; compliance), full R-PACS</td>
<td>5.2%</td>
<td>12.5%</td>
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<tr>
<td><strong>Stage 5</strong></td>
<td>Closed loop medication administration</td>
<td>8.4%</td>
<td>22.0%</td>
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<tr>
<td><strong>Stage 4</strong></td>
<td>CPOE, Clinical Decision Support (clinical protocols)</td>
<td>13.2%</td>
<td>15.5%</td>
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<tr>
<td><strong>Stage 3</strong></td>
<td>Nursing/clinical documentation (flow sheets), CDSS (error checking), PACS available outside Radiology</td>
<td>44.9%</td>
<td>30.3%</td>
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<tr>
<td><strong>Stage 2</strong></td>
<td>CDR, Controlled Medical Vocabulary, CDS, may have Document Imaging; HIE capable</td>
<td>12.4%</td>
<td>7.6%</td>
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<tr>
<td><strong>Stage 1</strong></td>
<td>Ancillaries - Lab, Rad, Pharmacy - All Installed</td>
<td>5.7%</td>
<td>3.3%</td>
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<tr>
<td><strong>Stage 0</strong></td>
<td>All Three Ancillaries Not Installed</td>
<td>9.0%</td>
<td>5.8%</td>
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Data from HIMSS Analytics® Database © 2014 HIMSS Analytics

N = 5,337  N = 5,458
<table>
<thead>
<tr>
<th>Region</th>
<th>Average</th>
<th>Median</th>
<th>Min</th>
<th>Max</th>
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<tr>
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<td>4.1700</td>
<td>0.0000</td>
<td>7.0710</td>
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<td>Tennessee (N=146)</td>
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HIMSS Analytics® Database Q4 2013

*West North Central Region includes Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, and South Dakota.
## HIMSS Analytics EMRAM Scores

<table>
<thead>
<tr>
<th>EMR Adoption Model&lt;sup&gt;SM&lt;/sup&gt; (EMRAM)</th>
<th>Average</th>
<th>Median</th>
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<th>Max</th>
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<td>3.9593</td>
<td>4.1910</td>
<td>0.0000</td>
<td>7.0710</td>
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<tr>
<td>Kansas City Core Based Statistical Area (CBSA) (N=40)</td>
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<td>0.0000</td>
<td>7.0630</td>
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*West North Central Region includes Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, and South Dakota.

HIMSS Analytics® Database Q4 2013
HIMSS Analytics Essentials Report
C&BI
Clinical Data Warehousing/Mining

Heart of America HIMSS Education Event
April 3, 2014
Collecting Clinical Data...

Chart 1: Percent of U.S. Hospitals with Clinical Data Warehousing/Mining

- 2009: 24.8%
- 2010: 31.3%
- 2011: 36.8%
- 2012: 41.1%
- 2013: 44.8%

NOTE: Total number of hospitals in HIMSS Analytics® Database on September 30, 2013 = 5,407

Historical data courtesy of the Dorenfest Institute

Source: HIMSS Essentials Report
Of the 48 vendors servicing the U.S. hospital market…

- Over one-third (38.3 percent) of the market is serviced by three vendors.
- Meditech has the highest market share in this market (14.7 percent)
- Over one-quarter (26.0 percent) of the market uses a vendor outside of the top six market share vendors.
Clinical Business Intelligence Market

Vendor market share by hospital size reveals...

- Cerner is the market leader in the under 100 beds and 200 – 399 beds segments
- Epic emerges with the highest market share in the 100 – 199 beds and 400+ beds market
- Self-Developed applications are the third most reported solution
  - Hospitals with less than 100 beds were more likely use Self-developed applications
Business Intelligence and Analytics Components

DESCRIPTIVE REPORTING AND ACCESS

STANDARD REPORTS
“What happened?”

AD HOC REPORTS
“What exactly is the problem?”

QUERY/DRILL DOWN
“What actions are needed?”

ALERTS
“Why is this happening?”

STATISTICAL ANALYSIS
“What happens if we try this?”

RANDOMIZED TESTING
“What will happen next?”

PREDICTIVE MODELING/FORECASTING
“What’s the best that can happen?”

PREDICTIVE AND PRESCRIPTIVE ANALYTICS
(THE “SO WHAT”)

OPTIMIZATION

Adapted from Competing on Analytics, Davenport and Harris, 2007

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DELTA Powered™ Suite

Analytics Maturity Model
Analytics Assessment (DPAA)
Generic Maturity Roadmap
Certification and Recognition
HIMSS Analytics has collaborated with The International Institute for Analytics (IIAnalytics.com) to create and administer the DELTA-Powered Analytics Assessment™ for healthcare organizations based on the DELTA model as presented in *Analytics at Work* and *Competing on Analytics*.
The International Institute for Analytics (IIA)

IIA is an independent research firm that guides organizations to better leverage the power of analytics. Working across a breadth of industries, IIA uncovers actionable insights, learned directly from our network of analytics practitioners, industry experts and faculty. We deliver critical information that helps your business run smarter.

Learn more at iianalytics.com

Tom Davenport
IIA Research Director and Co-Founder
Author of *Competing on Analytics* and *Keeping up with the Quants*
DELTA MODEL

The DELTA-Powered Analytics Assessment™ is based on the DELTA model framework, as presented in Analytics at Work and Competing on Analytics.

The DELTA model consists of five foundational categories:

- **Data**: For meaningful analytics data must be clean, common, integrated and accessible
- **Enterprise**: Analytical competitors take an enterprise approach to managing systems, data and people
- **Leadership**: Analytical organizations have leaders who fully embrace analytics and lead company culture towards data driven decision-making
- **Targets**: Analytics efforts must be aligned with specific, strategic targets that are also aligned with corporate objectives
- **Analysts**: Organizations need analytical talent that covers a range of skills from employees capable of basic spreadsheets to accomplished data scientists
DELTA Powered™ Analytics Maturity

Key Qualifiers

LEVEL 5: Leader
- Portrayed internally/externally as an analytical organization
- Derives new ways to leverage analytics for competitive advantage
- Analytical tools are broad and deep

LEVEL 4: Capable
- Pervasive, persistent, and timely data
- Consistent, timely, and seamless care coordination
- Effective alerts
- Proactive risk and health management

LEVEL 3: Aspiring
- Formal Data Governance/Quality
- Creating “one version of the truth”
- Job descriptions and career paths
- Analytical standards formalized and documented

LEVEL 2: Localized
- Initialize Data Governance, data model
- Itemized and prioritized project list
- Focused strategic successes
- Nurture and develop talent pools

LEVEL 1: Beginner
- Data producing systems inventoried
- Leader identification
- Tactical focus

Data Enterprise Leadership Targets Analysts

HIMSS Analytics
DPAA Participating Organizations

Akron Children's Hospital
Blackstone Valley Community Health Care
Butler Health System, Inc.
Carolinas HealthCare System
Centura Health Corporation
Cleveland Clinic
Dartmouth-Hitchcock
Duke University Health System, Inc.
Intermountain Healthcare
KishHealth System
Lakeland Regional Health System
Marshfield Clinic
Northeast Georgia Health System, Inc.
Northshore University Healthsystem
Orlando Health, Inc.
Seoul National University Bundang Hospital
Southwest Kidney Institute, PLC
The Stamford Hospital
Trinity Health System
UAB Health System
UC Davis Health System
University of Missouri System
University of Pittsburgh Medical Center
University of Virginia Medical Center
DPAA Benchmark profile

From the 22 benchmark organizations a total of 1,825 respondents have completed the survey:

Analytics Enablers: 399
Analytics Providers: 589
Analytics Users: 837

<table>
<thead>
<tr>
<th>Job Title</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>President or CEO</td>
<td>23</td>
<td>1%</td>
</tr>
<tr>
<td>CXO, Sr or EVP or Board Member</td>
<td>120</td>
<td>7%</td>
</tr>
<tr>
<td>Division Head, VP or GM</td>
<td>183</td>
<td>10%</td>
</tr>
<tr>
<td>Department, Unit Manager or Director</td>
<td>476</td>
<td>26%</td>
</tr>
<tr>
<td>Manager, Administrator or Supervisor</td>
<td>377</td>
<td>21%</td>
</tr>
<tr>
<td>Non-management position</td>
<td>646</td>
<td>35%</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Functional Role</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information Technology / Systems</td>
<td>23</td>
<td>1%</td>
</tr>
<tr>
<td>Analytics</td>
<td>21</td>
<td>1%</td>
</tr>
<tr>
<td>Corporate Administration / General Management</td>
<td>13</td>
<td>1%</td>
</tr>
<tr>
<td>Finance / Accounting / Claims</td>
<td>10</td>
<td>1%</td>
</tr>
<tr>
<td>Clinical: Outpatient Services</td>
<td>8</td>
<td>0%</td>
</tr>
<tr>
<td>Administrative / Clerical</td>
<td>6</td>
<td>0%</td>
</tr>
<tr>
<td>Quality Control / Assurance</td>
<td>6</td>
<td>0%</td>
</tr>
<tr>
<td>Clinical: Inpatient Services</td>
<td>6</td>
<td>0%</td>
</tr>
<tr>
<td>Clinical: Ancillary Services</td>
<td>6</td>
<td>0%</td>
</tr>
<tr>
<td>Research</td>
<td>2</td>
<td>0%</td>
</tr>
<tr>
<td>Other</td>
<td>1724</td>
<td>94%</td>
</tr>
</tbody>
</table>

Tenure

- >10 years: 47%
- 6 to 10 years: 20%
- 3 to 5 years: 14%
- 2 years: 9%
- 1 year: 5%
- <1 year: 5%
Hospitals With High EMRAM Scores still Lag with Analytics

Most Healthcare Providers Surveyed Have Analytical Aspirations
Data Concerns Are Most Important to Hospitals

Organizations Are Not As Effective With Data As They Want To Be

Effectiveness shown as a percentage of importance
High Importance
Low Effectiveness
**Improve Performance**
Healthcare organizations say these are important competencies, but demonstrate low effectiveness. This may be due to under investment in the competency or a lack of focus.

High Importance
High Effectiveness
**Continued Investment**
Areas of alignment. Competencies are important and healthcare organizations are mostly effective. Continued investment in these areas.

Low Importance
Low Effectiveness
**Identify Surplus Resources**
Healthcare companies said these competencies are not as important to them at this time and they are also mostly ineffective with these competencies.

Low Importance
High Effectiveness
**Selectively Allocate Resources**
Healthcare organizations see these as less important competencies, but are more effective at them. This could be due to the competency itself, or the organization may be over-investing.

Effectiveness Gap = Overall Importance - Effectiveness

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OVERALL BENCHMARK PRIORITY MATRIX

High Importance, Low Effectiveness

Data integration
Clinical tools
Funding adequacy
Staffing level
Organization
Iterative approach
Non-executive management utilization
Experimentation
Career paths
Non-management utilization

Data consistency
Strategic input
Use of external data
"Big Data" utilization
Data science skills
Prioritization
Enterprise collaboration
Enterprise technology management

Analytical tools
Data trustworthiness
Data quality
Data capture
Executive utilization
Medical staff practices
Government mandates
Executive advocacy
Consultative approach
Business skills
Data scalability
Opportunity identification
Goal setting

Low Importance, Low Effectiveness

Low Importance, High Effectiveness

Benchmark Effectiveness

BENCHMARK IMPORTANCE

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Frequently asked Questions

HIMSS Analytics DELTA Powered™ Analytics Assessment

Questions
James Gaston – James.Gaston@HIMSSAnalytics.org
Continuity of Care℠

Maturity Model
Certification and Recognition
Continuity of Care Model Purpose

To provide thought leadership and guidance for the industry along its journey in breaking down silos across care providers to achieve:

- A dynamic interconnected community wide patient record supporting:
  - Coordinated patient care
  - Patient engagement
  - Advanced analytics

To complete the picture painted by existing EMRAMs that demonstrate the effective deployment and use of information technology.
Continuity of Care Model Methodology

Collaboration across HIMSS Analytics’ global team

Follows existing HIMSS Analytics EMRAM℠ methodology
  – Consists of 8 stages (0 – 7)
  – Set of required capabilities at each stage

Model includes provider and vendor feedback
  – Pan-European and US review participants
  – Pan-European workgroup included reviewers from NL, ES and Nordic countries comprising representatives from regional and national health authorities, strategic planning organizations, CIOs of groups or regions, industry and HIMSS consultants
  – 3 rounds of external reviews combined with internal feedback resulted in development of questionnaire and algorithm
  – Overall very positive reactions / feedback!
Continuity of Care Model Categories

- Organizational strategy
- IT system capabilities
- Standards and interoperability frameworks (without designating specific standards!)
- Health information exchange
- Patient care coordination
- Patient/consumer engagement and empowerment
- Advanced analytics:
  - At the point of patient care
  - Population management
  - Evidence-based clinical practice advancement and other research efforts
  - Business / financial / operations management
Continuity of Care Model Design

Globally applicability

- Scoring adapted for localization, regional health authorities

Primary Target Audience:

- Integrated Delivery Networks (IDN)
- Ministries of Health
<table>
<thead>
<tr>
<th>STAGE 0</th>
<th>Limited to No E-communication</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAGE 1</td>
<td>Basic Peer-to-Peer Data Exchange</td>
</tr>
<tr>
<td>STAGE 2</td>
<td>Patient Centered Clinical Data using Basic System-to-System Exchange</td>
</tr>
<tr>
<td>STAGE 3</td>
<td>Normalized Patient Record using Structural Interoperability</td>
</tr>
<tr>
<td>STAGE 4</td>
<td>Care Coordination based on Actionable Data using a Semantic Interoperable Patient Record</td>
</tr>
<tr>
<td>STAGE 5</td>
<td>Community Wide Patient Record using Applied Information with Patient Engagement Focus</td>
</tr>
<tr>
<td>STAGE 6</td>
<td>Closed Loop Care Coordination Across Care Team Members</td>
</tr>
<tr>
<td>STAGE 7</td>
<td>Knowledge Driven Engagement for a Dynamic, Multi-vendor, Multi-organizational Interconnected Healthcare Delivery Model</td>
</tr>
</tbody>
</table>
Continuity of Care
Stage 1

Basic peer-to-peer data exchange

- Primarily *peer to peer exchange*, including basic push, pull, secure messaging and view only portals
- Limited care coordination data exchange
- Patient engagement limited to electronic communications such as secure messaging
- *Clinical and financial analytics functions restricted to silo source systems within the organization*
- DELTA Level 2
- HIMSS Interoperability Definition “Foundational”
Continuity of Care
Stage 4

Care Coordination based on Actionable Data using Semantic Interoperable Patient Record

- **Bi-directional dynamic exchange** with **semantic translation** into **actionable standardized data** (i.e. Semantic Interoperability)
- Dynamic, event-based, system-driven interactions (e.g. order sets, notifications, alerts, reminders) across the participating care team
- Patient enabled to **incorporate patient sourced data** and to refill prescriptions online
- **Analytics start driving provider actions** for both, clinical and financial benefit realization (predictive alerts)
Continuity of Care
Stage 7

Knowledge Driven Engagement for a Dynamic, Multi-vendor, Multi-organizational Interconnected Healthcare Delivery Model

- **Fully flexible dynamic interconnected multi-vendor/organization community patient record across the patient care and health continuum**
- Completely coordinated care including health maintenance, prevention and wellness information
- **Patient control of PHR information** for assurance of completeness and accuracy
- **Dynamic analytics capabilities at the point of care and for business/financial operations, population health management, bio surveillance and advancement of evidence based clinical practice**
Conclusion

Maturity models give healthcare organizations a framework to
- Understand their current capabilities, standing
- Imagine what is possible
- Roadmap for improvement

HIMSS Analytics offers free access to a coordinated and complimentary set of maturity models for the betterment of healthcare
- EMRAM℠
- DELTA Powered™
- TRMAM℠ - Total revenue Management Adoption Model
- Continuity of Care℠