Data Integration Systems for Health Care

April 2009
In its most general and generic usage, the phrase “Electronic Health Record” is used to describe any digital representation of Health Information with little or no concern about how this information is stored and retrieved.

Branham Group Inc. ‘eHealth in Canada, Building Momentum’, Copyright 2007
DISH (Data Integration Systems for Health Care)

**Framework** - Foundation for all BI needs

- Clinical Indicators
- Provincial Benchmarks

Best Practices, Extensibility, Interoperable, Manageability

Shared Applications

Collaboration

Shared Costs

Shared Priorities
DISH a Framework for Delivery, Extensibility, and Efficiency

Federal
Ontario
LHINS
Regions
Hospitals

All have common requirements within their collective domains

Hospitals are the primary source of information for all other users within the province

Approach:
- Define and Deliver Business solutions – *Software tools are not a solution*
- Applications will be reusable
- Be Interoperable – *Leverage existing investments*,
- Must be an Extensible Framework, grow as environment changes
- Encourage sharing and exchange of applications – Develop once, use many
- Requires a learning methodology integrated with Governance
- Aligned with user/customer capacity
Unique Challenges – Health Care

- Limited Resources/Capacity
- Too many Dynamic data changes
- Cut & Paste processes
- Limited Collaboration
- Too many Masters (everybody wants something)
What will be initially delivered in Phase 1

Phase 1

- Clinical Indicators Scorecard,
- 3 Programs: Emergency, Surgery, Critical Care
  - Includes Drill down to details (Management & Operational scope)
  - Historical Comparisons
  - Standard access to DADs and NACRS
- Provincial Benchmarking, Province wide not just NHS slice
- Result of Phase 1
  - Each Ontario Hospital, Region, LHIN could immediately utilize all of Phase 1 with minimum enhancements (exclude: Mental Health, Rehab)
  - Target completion – 1st Quarter 2009
DISH Functionality

- 18 Monthly Acute & Ambulatory Indicators
- Manual Indicator capability
- Dashboard Commentary capture
- Designed for single Hospitals, Multi-site, Gov’t Health Agencies
- Sophisticated Dashboard stop-lighting and target trending
- Plex/Plus capabilities
- Executive and Analyst capabilities
- Online historical data retention
- Provincial & LHIN Benchmarking
- Single Patient view
<table>
<thead>
<tr>
<th>Ser#</th>
<th>KPI Req Ref (DRD)</th>
<th>KPI Description</th>
<th>Persona</th>
<th>Indicator priority</th>
<th>Data Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>R2.1</td>
<td>Total Weighted cases</td>
<td>Corp</td>
<td>1</td>
<td>DAD</td>
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<tr>
<td>2</td>
<td>R2.2</td>
<td>Average PAC/10 RIW (Acute/Newborn/MH)</td>
<td>Corp</td>
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<td>DAD</td>
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<tr>
<td>3</td>
<td>R2.3</td>
<td>HSMR shall be calculated at the Corporate Level only</td>
<td>Corp</td>
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<td>5</td>
<td>R2.9</td>
<td>Percentage of ALC Days</td>
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<td>16</td>
<td>R2.20</td>
<td>% of ED Patients (Triage Levels I, II) where LOS is Less than 8 Hours</td>
<td>Corp</td>
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<td>NACRS</td>
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<td>17</td>
<td>R2.21</td>
<td>% of ED Patients (Triage Levels III) where LOS is Less than 6 Hours</td>
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<tr>
<td>18</td>
<td>R2.22</td>
<td>% of ED Patients (Triage Levels IV, V) where LOS is Less than 4 Hours</td>
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<td>20</td>
<td>R2.25</td>
<td>Death in low mortality surgical CMG</td>
<td>Surgery</td>
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<td>DAD</td>
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<td>21</td>
<td>R2.26</td>
<td>Rate of reported misadventures for surgical patients</td>
<td>Surgery</td>
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<td>DAD</td>
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<td>22</td>
<td>R2.27</td>
<td>Accidental puncture or laceration</td>
<td>Surgery</td>
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<td>DAD</td>
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<td>28</td>
<td>R2.33</td>
<td>Cardiac arrest after major surgery</td>
<td>Surgery</td>
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<td>DAD</td>
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<tr>
<td>29</td>
<td>R2.34</td>
<td>AMI after major surgery</td>
<td>Surgery</td>
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<td>DAD</td>
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<tr>
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<td>Crude Rate Surgical Deaths</td>
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<td>39</td>
<td>R2.44</td>
<td>% Left without Being Seen</td>
<td>ED</td>
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<td>R2.46</td>
<td>ED Wait Time Admissions by Hour</td>
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<td>% Patient Admission through ED</td>
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<td>Deaths within 6 hrs of admission to ICU</td>
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<td>DAD</td>
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<td>R2.54</td>
<td>Unplanned Return to ICU within 24 hrs</td>
<td>CC</td>
<td>1</td>
<td>DAD</td>
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</table>
Major Technology Challenges

- Different levels of Granularity
- Aligning performance against targets/benchmarks
- Dynamic Reporting requirements
- OLAP too inflexible for external data
- Can we make this any more complex?
SAS and Technology Challenges

- Initially thought traditional BI approach was appropriate
- Dynamics, Granularity, and Perpetual change painfully told us that traditional BI would not work.
- What did SAS do differently?
  - Consulted Technology and Domain experts
  - Background ETL to structure data. 2 main sets, 1 for Exec’s, Program managers, 1 for Analysts
  - Utilized Dynamic Stored Procs to facilitate dynamic views
  - Stored Procs hold business rules to allow for accurate and consistent calculations, single point of change, enhancements
  - Created a single view of in/out Patient
## The Business Framework

<table>
<thead>
<tr>
<th>Groups/Domain</th>
<th>What are we working on?</th>
<th>What needs to Happen?</th>
</tr>
</thead>
<tbody>
<tr>
<td>LHINS</td>
<td></td>
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<td>Regions</td>
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<td>Hospitals</td>
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<tr>
<td>Result</td>
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</tbody>
</table>

### Business Approach

Initial DISH deliverable will be Clinical & Provincial Benchmarking available as Shareable module

Each module developed once and used by many

Collaborative to deliver next business module.

- Mental Health, Disease control, etc.
Today's suggested opportunities for HUG

- Explore ability to collaborate on SAS code
- Educate Stakeholders;
  - Current Challenges
  - Opportunities
  - Logistics
- Standardize KPI’s and Benchmarking