

Data Warehousing Dashboards & Data Mining

Empowering Extraordinary Patient Care

Your phone has been automatically muted. Please use the Q&A panel to ask questions during the presentation.

The screenshot shows a Cisco WebEx Event Center window titled "Cisco WebEx Event Center - Dry Run - charge". The main content area displays a presentation slide with the title "Embrace the new world of healthcare" and the GALEN logo. The slide text includes:

- PROFESSIONAL Services**
 - Project Assessment**

Galen can leverage its extensive EHR experience to appraise the condition of your EHR rollout. Drawing on its history of leading successful EHR deployments, Galen will identify areas of weakness to mitigate risk and put the project back on track.

 - Evaluate Current State
 - Review Organizational Goals
 - Create Road Map to Success
 - Project Management**

Galen provides project management solutions to help ensure your EHR rollout success. Galen will provide your organization with the experience necessary to identify, reduce and eliminate project risks.

 - Implementation Management
 - Resource Management
 - Project Plan Design and Execution
 - Site Preparation
- Implementation Services**

Galen's keen understanding of EHR functionality and technical infrastructure uniquely positions it to positively impact every aspect of the EHR implementation process.

 - Review and Document Current State Workflows
 - Evaluate Design Requirements
 - Develop Future State Design
- Connecting Community Healthcare**

Galen understands the challenges that come with extending your EHR to physicians outside of your organization. Whether you're taking advantage of Stark Relaxation or just trying to provide a way for community physicians to get a complete view of their patients, Galen can help you through the process. Together, we can review your unique situation and help structure an EHR that creates a seamless community connection.

At the bottom of the slide, there is a "vitalcenter" logo and a "SEARCH" button.

On the right side of the interface, there are two panels:

- Participants**: Shows a list of participants. Under "Panelists: 1", there is "Galen Healthcare Solutions (host)" with a "Mute" button. Under "Attendees:", there is "Tracy Kimble".
- Q&A**: A panel for asking questions. It has a "Collapse the panel" button at the top. Below it is a text input field with a placeholder: "Select a participant in the ask menu first and type your question here. There is a 250 character limit." At the bottom of the Q&A panel, there is an "Ask:" dropdown menu set to "All Panelists" and a "Send" button.

A red arrow points from the main slide area towards the Q&A panel.

Introduction

Matt Hoover

- Consultant, Technical Services
- **BBA & Bachelor of Management Information Systems**
- **5+ years working in Healthcare IT**
- **10+ years Analytics and Business Intelligence**

Presentation Scope

- **Investigate data mining, and its applicability to the healthcare industry.**
- **Identify performance indicators and opportunities to monitor via an integrated clinical dashboard.**
- **Disclaimer: This presentation**
 - will be technical
 - was designed to be applicable to a broad audience
 - will utilize an over-simplified, contrived example

Definitions

- **Data Mining**
 - an interdisciplinary subfield of computer science, is the computational process of discovering patterns in large data sets involving methods at the intersection of artificial intelligence, machine learning, statistics, and database systems.
- **Dashboard**
 - A graphical summary of various pieces of important information, typically used to give an overview of a business.

Why mine data?

- **Provides answers to questions**
- **Provides insights to population trends**
- **Provides actionable data to help set goals**

Why dashboard data?

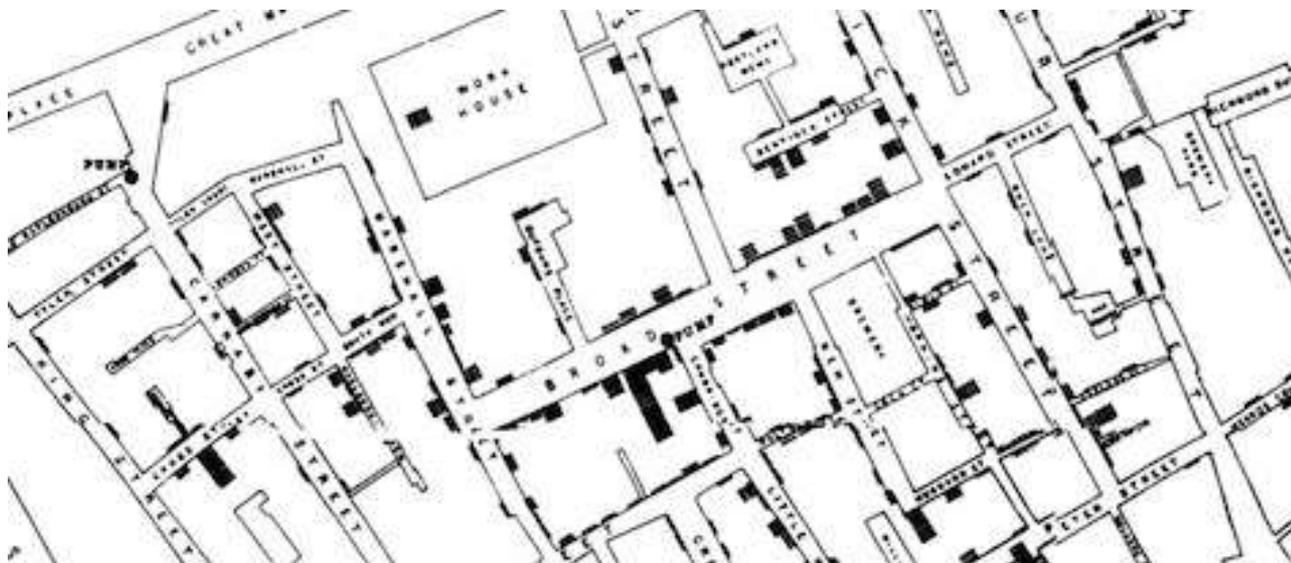
- **Easy to view**
- **Single source of truth**
- **“One stop shop” for goal measurement**
- **Display aggregated data in a single interface**

Poll

- **Data warehouse use?**

Data Mining History

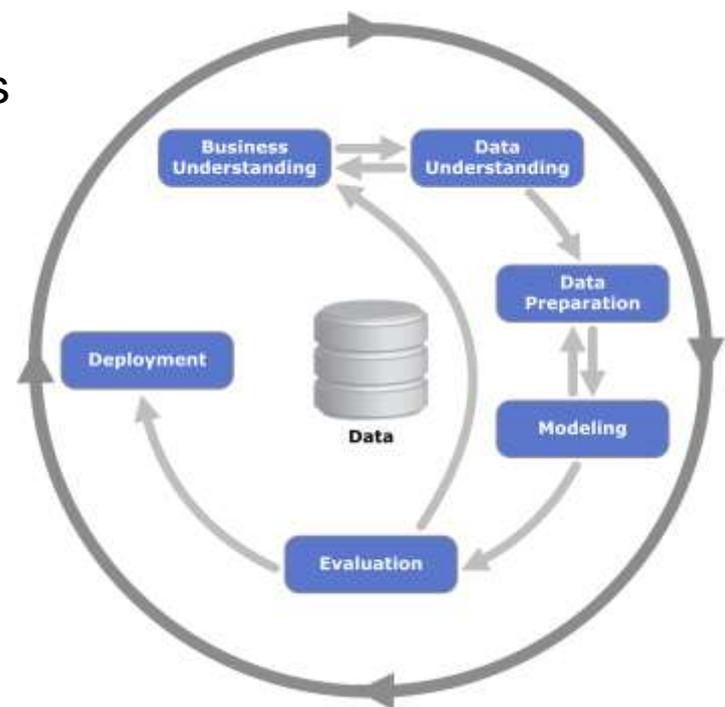
- **Data mining in healthcare is not a new science**
- **Popular example: John Snow 1854**



Data Mining: CRISP-DM

- **Cross Industry Standard Process for Data Mining**

- Popular process model
- Breaks down process into six major phases
 - Business Understanding
 - Data Understanding
 - Data Preparation
 - Modeling
 - Evaluation
 - Deployment



Data Mining: Population Health

- **Business Understanding**
 - How can we improve care and realize opportunities in our patient population?
- **Data Understanding**
 - What do we have and what are the known issues?
- **Data Preparation**
 - Clean and prep for modelling tools
- **Modeling**
- **Evaluation**
 - Are the questions answered? Are there new questions we can answer?
- **Deployment**
 - Dashboard

Data Mining: First Steps

- **Doesn't have to be complicated**
- **Can leverage existing data models and resources**
- **Understand your data**

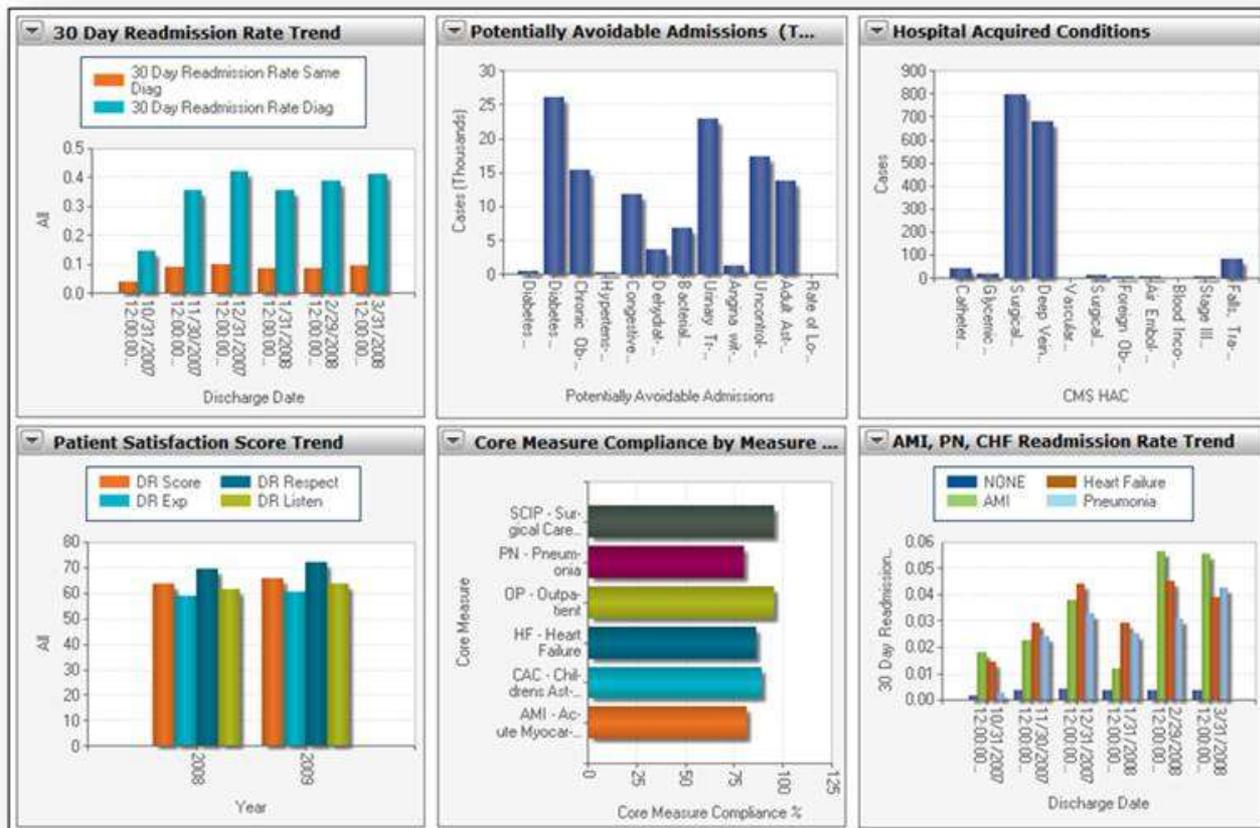
Poll

- **Dashboard use**

Dashboard: Additional Benefits

- **Additional Benefits**
 - Transparency
 - Optimize efficiency
 - Behavior modification tool (when accompanied with active governance)
 - Allows benchmarking with peers

Dashboard: Example



Dashboard: Example



Treatment Needs	Current	Next 90 Days	Next 180 Days
Diabetes			
• HbA1c Screening	2	1	1
• HbA1c Control	4	3	0
• LDL Screening	6	4	2
• LDL Control	2	1	0
• Nephropathy Monitoring	1	1	1
• BP Control	2	1	0
Cardio			
• LDL Screening	16	21	26
• LDL Control	2	3	1
Preventative			
• Flu Immunization	1066	1066	1066
• Pneumococcal Immunization	178	178	178
• Chlamydia Screening	21	22	23
• Cervical Cancer Screening	206	206	206
• Breast Cancer Screening	159	163	174
• Colorectal Cancer Screening	312	312	312
Meds Mgmt			
• ACE/ARB/Diuretic/Digoxin	265	251	218

Measures	
DM - HbA1c Scrn	○
DM - HbA1c Ctrl	○
DM - LDL Scrn	○
DM - LDL Ctrl	○
DM - Nephro	○
DM - BP Ctrl	○
Cardio - LDL Scrn	○
Cardio - LDL Ctrl	○
Flu Immunization	Not Compliant
Pneumococcal Immunization	○
Chlamydia Scrn	○
Cervical Scrn	○
Breast Scrn	○
Colon Scrn	○
Meds - ACE/ARB	○

Dashboard: Where to start?

- **Before diving into a solution ask yourself:**
 - What are the biggest drivers for a dashboard?
 - Is there data to support the drivers?
 - Where does the data live?
 - Who is going to be using the dashboard?
 - How timely does the data need to be?

Dashboards: PRO - Buy vs. Build

- **Buy**
 - Out-of-the-box solution
 - Many are cloud based
 - Additional features not in original drivers for adoption
- **Build**
 - Custom designed to fit a particular need
 - Typically faster data refresh time
 - Allows for organic growth

Dashboards: CON - Buy vs. Build

- **Buy**
 - Control of data
 - Timeliness of data refresh
 - Usability & Integration
 - Flexibility
 - Cost
- **Build**
 - Time to implement
 - Technical Infrastructure
 - Maintenance

Dashboards: Buy vs. Build

- **Many solutions available**
- **Understand your business**
- **Understand your data**
- **Evaluate immediate and foreseeable needs**
- **Include stakeholders**

Dashboards: Fictitious Case Study

- **Galen Medical Group**
 - 150 providers, mostly primary care
 - Single EHR shared among all providers
 - No current BI tools in place
 - Large diabetic patient population
 - Just entered a pay for performance initiative
 - Initial scores relating to diabetic patients are low

Dashboards: Fictitious Case Study

- **What are the biggest drivers for a dashboard?**
 - Help manage chronic diseases in the patient population
 - Improve quality scores
- **Is there data to support the drivers?**
 - Yes, the Galen Medical Group has been documenting charts in a single EHR for the last decade.
- **Where does the data live?**
 - The EHR data is housed in a central data center maintained by the Galen Medical Group.

Dashboards: Fictitious Case Study

- **Who is going to be using the dashboard?**
 - Primary care providers
 - Office Staff
 - Performance Initiative Analysts
- **How timely does the data need to be?**
 - One day lag will be acceptable

Dashboards: Fictitious Case Study

- **Solution requirements derived from answers to questions:**
 - Must have a focused solution for chronic disease management
 - Must be able to extract data directly from existing EHR
 - Must integrate with the EHR
 - Minimal impact to workflows
 - Accessed directly from within EHR without separate login
 - Measures need to be updated nightly

Dashboards: Fictitious Case Study

- **Initial questions answered. Next steps?**
 - Investigate possible solutions
 - Out-of-the-box
 - Custom built
 - Pro/Con analysis of solutions
 - ROI analysis

Dashboards: Simple ROI Analysis

- **Interesting Statistics:**

- In 2009, the Institute of Medicine estimated that there was \$765 billion in avoidable costs in the U.S. health care system (Source: Institute of Medicine).
- More than 80% of IT-directed warehouses took three years to fail and were replaced by data marts built to purpose by individual business units. In contrast, data warehouses sponsored by business executives exhibited a success rate of greater than 70% (Source: Gartner Top Actions for Healthcare).
- 90% of executives surveyed identified quality improvement as the most popular use for analytics (eHI and CHIME survey).

Dashboards: Simple ROI Analysis

- **R: Estimated yearly increase in revenue**
- **T: Program length**
- **C: Total cost of implementing dashboard solution**

- **ROI = $\frac{(\textit{Gain from Investment} - \textit{Cost of Investment})}{\textit{Cost of Investment}}$**

- **Program ROI = $\frac{((R \times T) - C)}{C}$**

Dashboards: Fictitious Case Study

- **Next Steps**

- Make a selection
- Set measurable goals and objectives
- Implement in Phases
 - Selected champions first
- Clearly communicate goals and objectives
- Provide feedback loop for comments and feedback

Dashboards: Fictitious Case Study

- **Happy Ending**

- Solution adopted
- Diabetic patient population becomes more managed
- Quality scores improve
- Additional chronic disease populations are added to the dashboard
- the Galen Medical Group publishes a success story and becomes a respected resource for other groups looking to embark on a similar endeavor.

Questions?



- **Success stories:** <http://blog.galenhealthcare.com>
- **Wiki:** <http://wiki.galenhealthcare.com>

Check Out Our Other Custom Solutions:

The screenshot shows the website www.galenhealthcare.com/products-services/technical-services/custom-solutions/. The navigation menu includes 'Who We Serve', 'Products & Services', 'Knowledge Center', and 'Company'. The 'Products & Services' dropdown menu is open, displaying three columns of options:

- Products**
 - eNotify
 - eCalcs
 - Dragonfly
 - VitalCenter
 - Note Form Reporting
- Professional Services**
 - Project Assessment Operations
 - Program Management
 - Project Management
 - EHR Marketing
 - Project Governance
 - Implementation Services
 - Application Deployment
 - Workflow Assessment
 - ICD-10
 - Meaningful Use
 - Support
 - Upgrade Services
 - Professional Training
- Technical Services**
 - HIE
 - Conversions
 - Integration Services
 - Reporting
 - Contract Programming
 - Technical Consulting
 - Custom Solutions**
 - Technical Training

An arrow points to 'Custom Solutions' in the Technical Services column. The footer features the 'vitalcenter' logo and the 'GALEN HEALTHCARE SOLUTIONS' logo.

Thank you for joining us today, for additional assistance....

You can contact us through our website at www.galenhealthcare.com

