

HIMSS[®]19

CHAMPIONS OF HEALTH UNITE

Global Conference & Exhibition
FEB 11-15, 2019 | ORLANDO

How Practical Big Data Management Can Drive Value in Healthcare

Big Data Symposium Session BG5, Monday February 11, 2019, 2:30-3:30PM



DISCLAIMER: The views and opinions expressed in this presentation are those of the author and do not necessarily represent official policy or position of HIMSS.

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Conflict of Interest

I have no real or apparent conflicts of interest to report.

Agenda

- Define the evolving role of data management in the field of health care “big data”
- Discuss some of the new competencies for effectively leveraging big data at scale
- Share some examples of how this is being applied at a large health care system



Learning Objectives

1. Identify data management and data governance best practices that are essential to a Big Data ecosystem
2. Explore how governance applies to new and existing Big Data programs
3. Assess how an effective Big Data strategy can address challenges and enhance data sharing efforts while being mindful of big data ethics
4. Demonstrate real-world implementations of Big Data management best practices in healthcare and how they support value delivery and strategic outcomes

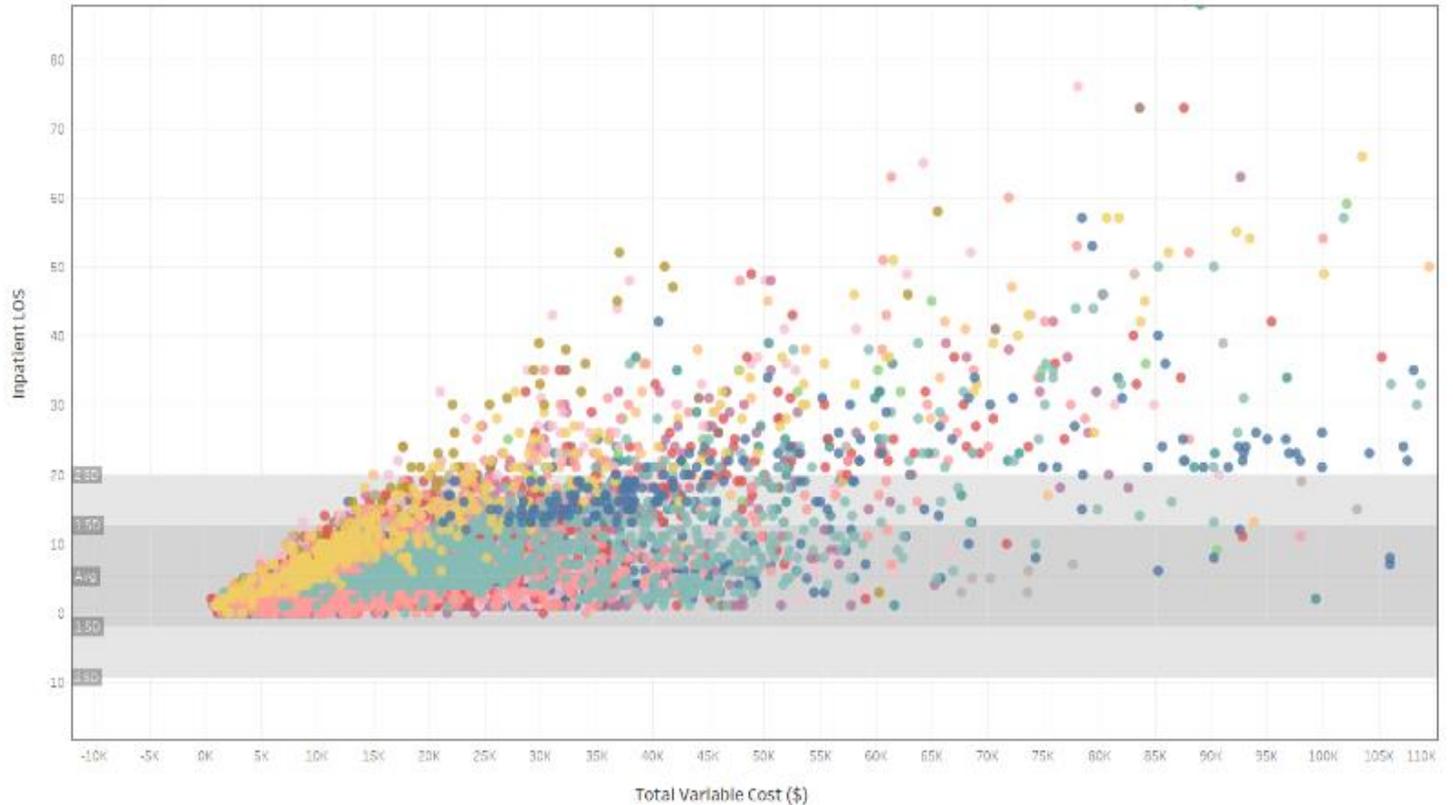


Here's Your Report!

Starting with the end in mind...

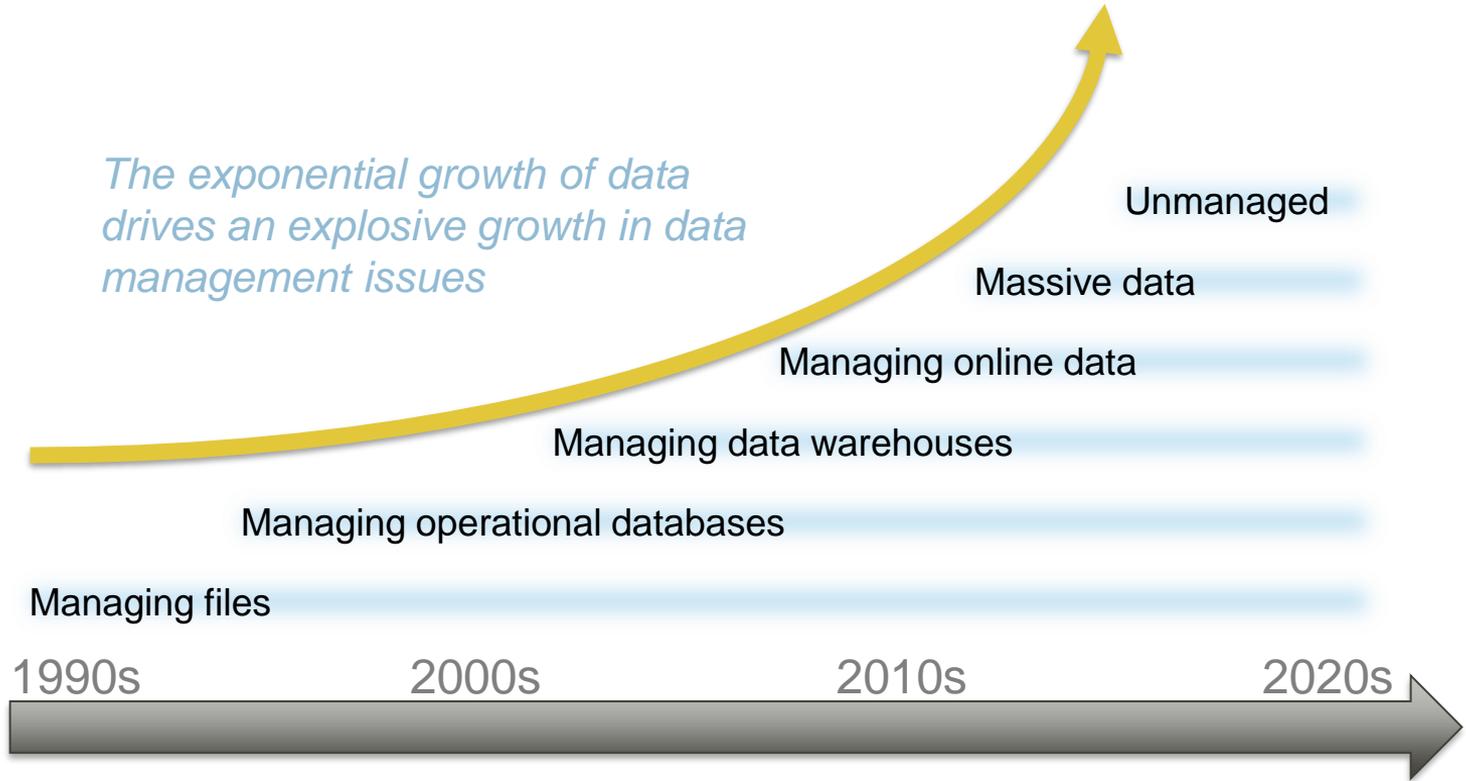
Total Variable Cost vs. Inpatient LOS

Attributed by Service Line (color)



The Changing Role and Scope of "Data Management"

The exponential growth of data drives an explosive growth in data management issues



Human Valuation and Big Data

Valuation Area

What is the source of the data?

What do we know about this data and what it means?

What's in the data; how representative is it?

How was the data obtained and managed?

Who else is using this data?

How consistent is the data with other data?

How good was the process used to create this data?

How current is the data?

How much is it changing?



Implications of Today's Big Data

*We have to know and manage a lot ABOUT our data,
not just the data itself*

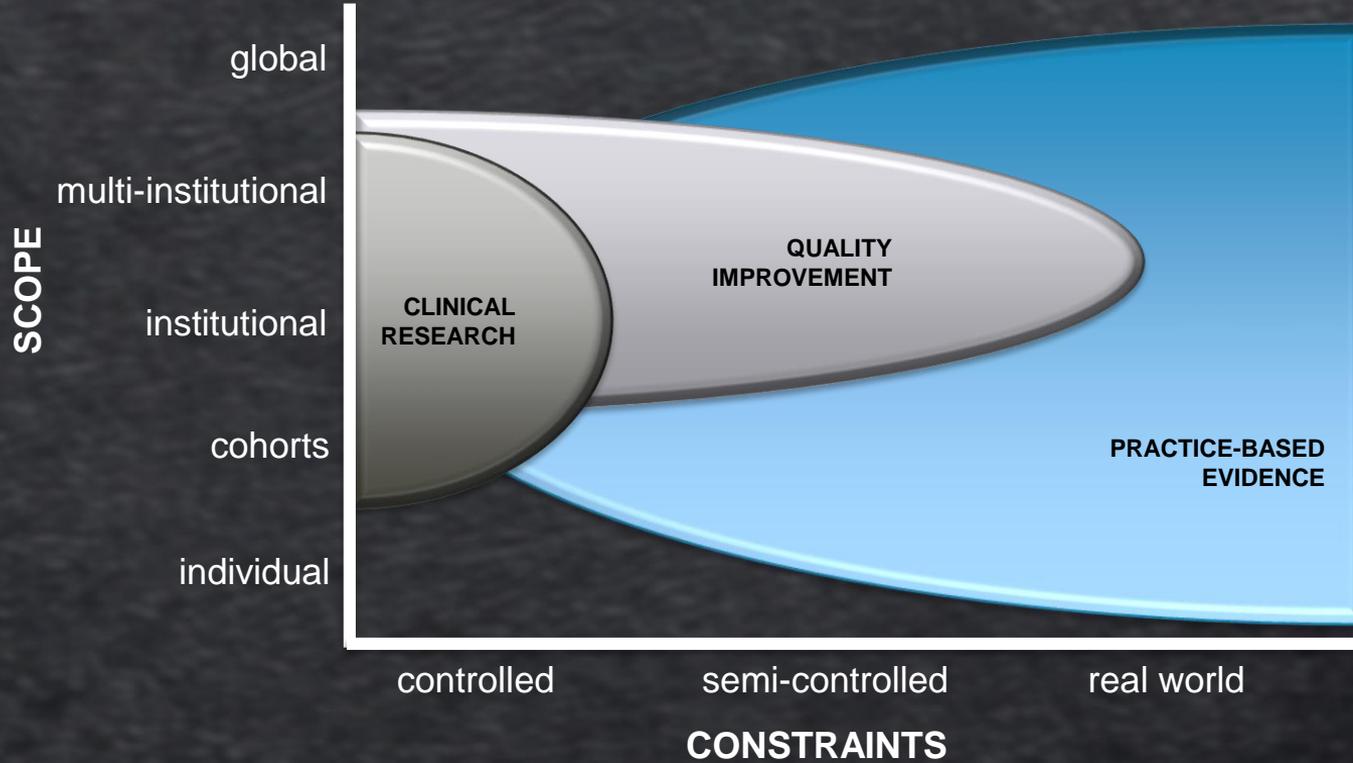
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Lineage / Pedigree
Business Context
Quality
Reasonableness
Consistency
Pervasiveness
Socialization
Controls
Currency
Volatility



Why is this so different?



Dismantling the Hype

The Buzz

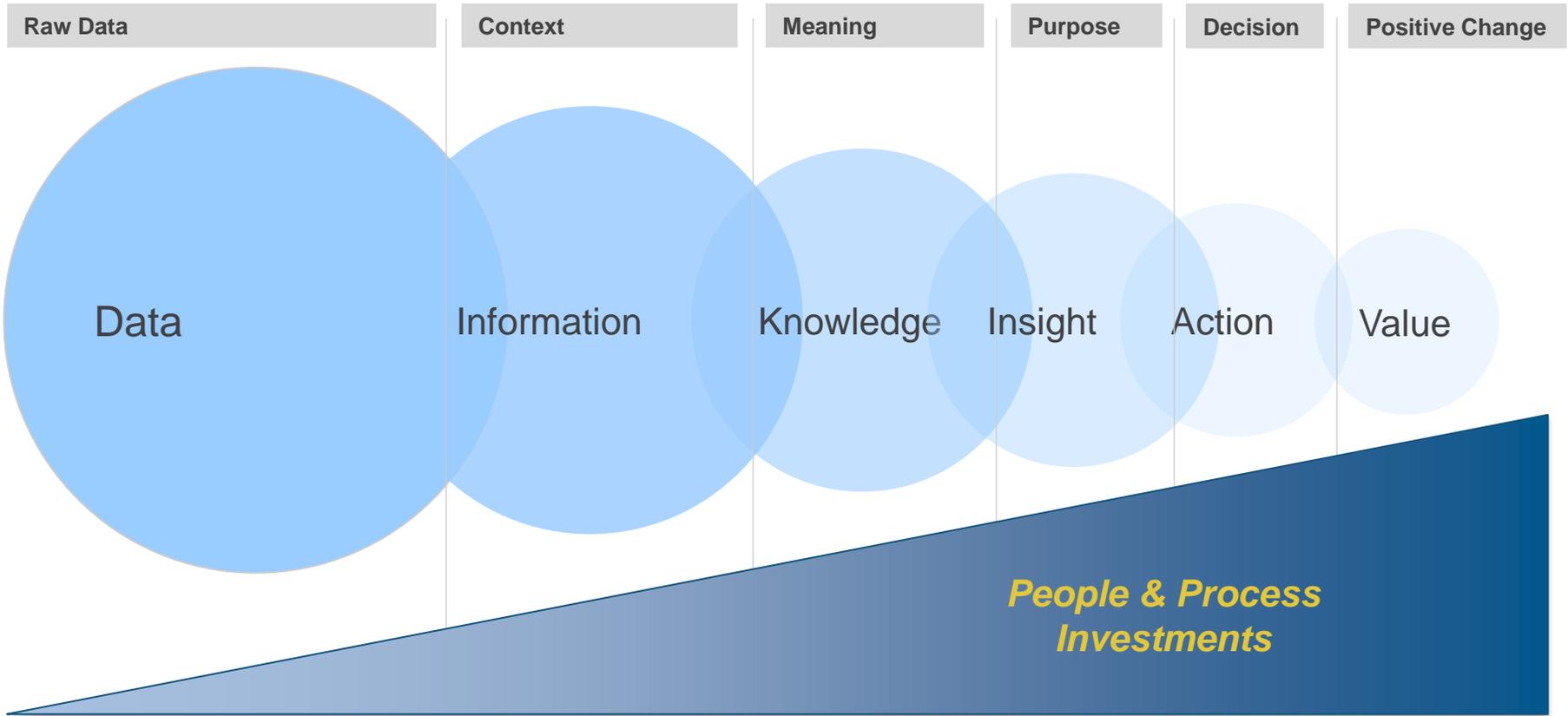
- A technology problem
- You can fix it with text mining, machine learning, AI, Hadoop, or another buzzword
- Standards is the fix
- Sticking to one vendor is a fix
- Outsourcing helps

The Reality

- A people / process problem
- Garbage in, garbage out...but we can improve it even if we can't fix it
- Standards help a lot
- Sticking to one vendor is impossible, but does help
- No vendor knows your business better than you



Harnessing Big Data is an Organizational Competency





Designing for Reusability

Reusability in Analytics: Products!

PROJECTS

- Stakeholders are project area experts
- Effort is focused on predefined questions
- Work is relevant to project team
- Timeline is project driven
- Data definitions are project specific
- Data structured for single use
- Little-to-no analytical code reuse
- Release available to project stakeholders



PRODUCTS

- Stakeholders are functional experts
- Questions are not predefined
- Work must be relevant to multiple customers
- Timeline is engineering driven
- Data definitions are enterprise-wide
- Data is structured for broad re-use
- Analytical models are built for multiple projects
- Release available to entire enterprise



Investing in Competencies

DATA GOVERNANCE	Data Policies and Standards	Data Roles & Stewardship	Governance & Decision Making	Master Data Management (MDM)	Asset Provisioning, Management & Certification	Data Quality Management
BUSINESS OPERATIONS	Data Strategy Formalism	Consulting and Guidance	Analytics Competency Development & Staffing	Data Operations Management and Controls	Knowledge Management	Community Engagement
ENGINEERING OPERATIONS	Engineering Management	Architecture Design and Management	Data Model Engineering & Management (Domains)	Analytical Model Engineering & Management	Lifecycle and Quality Management	Metadata Management



Centralized vs. Federated Capability Development

Like many academic medical systems, UNC HCS has a diversified, empowered culture

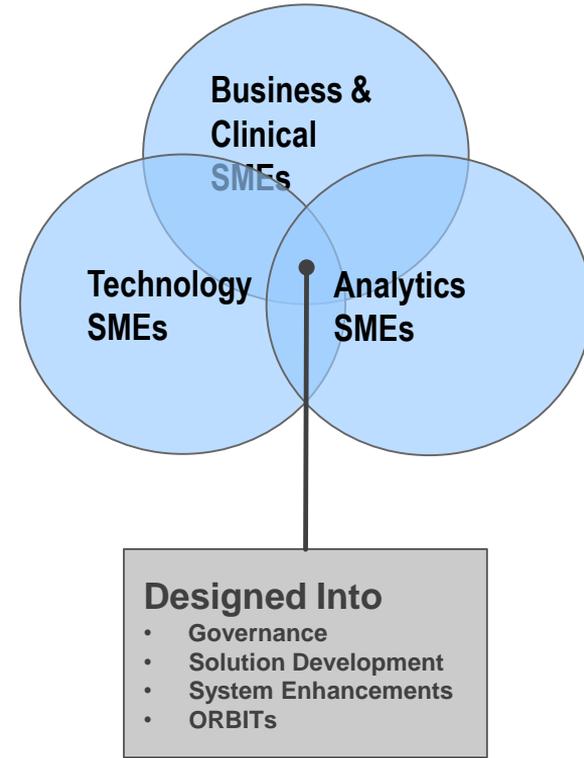
- Organizational units with deep subject matter experts (SMEs)
- Spirit of research, innovation, and entrepreneurship

Any journey with analytics must respect those cultural norms

- Fully centralized → “ivory tower”, bottlenecks, loss of institutional context and SME
- Fully federated → no economies of scale, impossible to establish a single source of truths

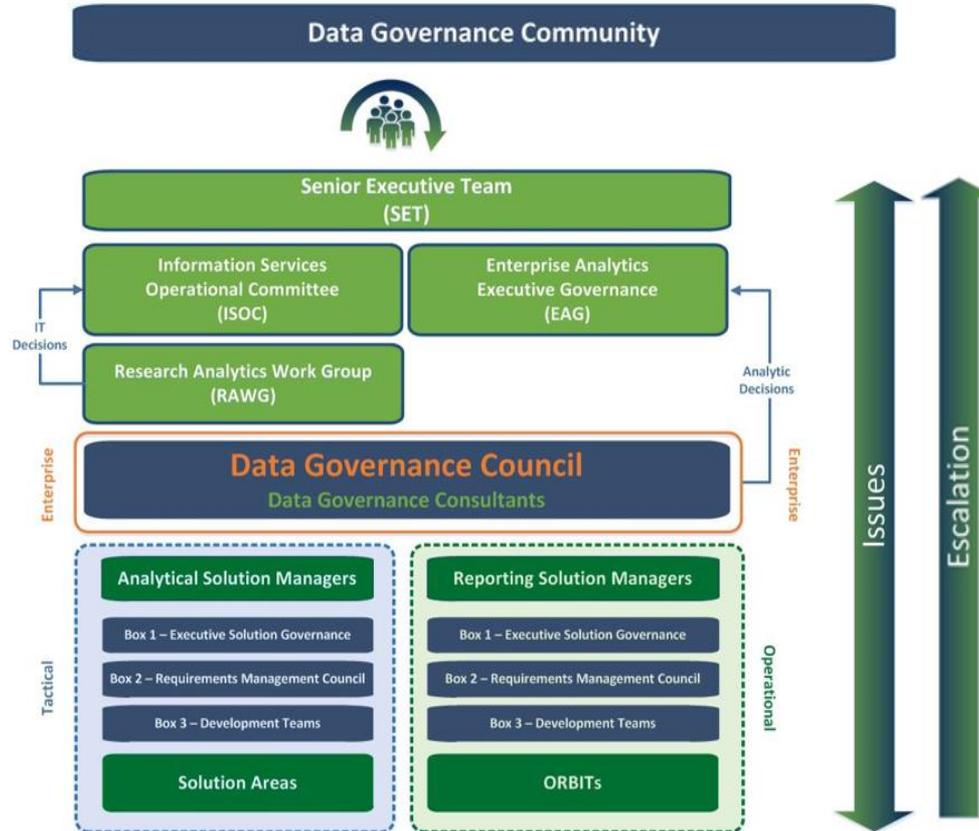
We opted to pursue a hybrid model

- Centralize building reusable assets
- Federate the use and extension of those assets
- Bring federated SMEs into all build-related work
- Help federated users be more effective with data / analytics



Data Governance

DATA GOVERNANCE	Data Policies and Standards	Data Roles & Stewardship	Governance & Decision Making	Master Data Management (MDM)	Asset Provisioning, Management & Certification	Data Quality Management
BUSINESS OPERATIONS	Data Strategy Formalism	Consulting and Guidance	Analytics Competency Development & Staffing	Data Operations Management and Controls	Knowledge Management	Community Engagement



Data Governance Program Pillars

DATA GOVERNANCE	Data Policies and Standards	Data Roles & Stewardship	Governance & Decision Making	Master Data Management (MDM)	Asset Provisioning, Management & Certification	Data Quality Management
	BUSINESS OPERATIONS	Data Strategy Formalism	Consulting and Guidance	Analytics Competency Development & Staffing	Data Operations Management and Controls	Knowledge Management



Data Profiling
 Transparency of results
 Quality thresholds
 Prioritized remediation efforts



Application inventory
 System interfaces inventory
 Business glossary
 Application data dictionaries
 Core reports inventory
 Data release inventory



Source of truth for key shared data
 Common terms and groupings for integrated analytics



Assign decision rights and accountabilities
 Permissions
 Standardize data movement and access approval methods
 Further define regulation
 DG Maturity



Group data into unique domains
 Nominate Information Owners
 Data Steward selection and engagement



Tool inventory
 Remove duplication of efforts and solutions
 Clearly prioritize analytics initiatives
 Drive progress toward self-service analytics

Asset Certification

- Certification is a review process of key elements and tools used for decision making across the enterprise. Certification provides:

- Reliability
- Traceability
- Standardization
- Documentation

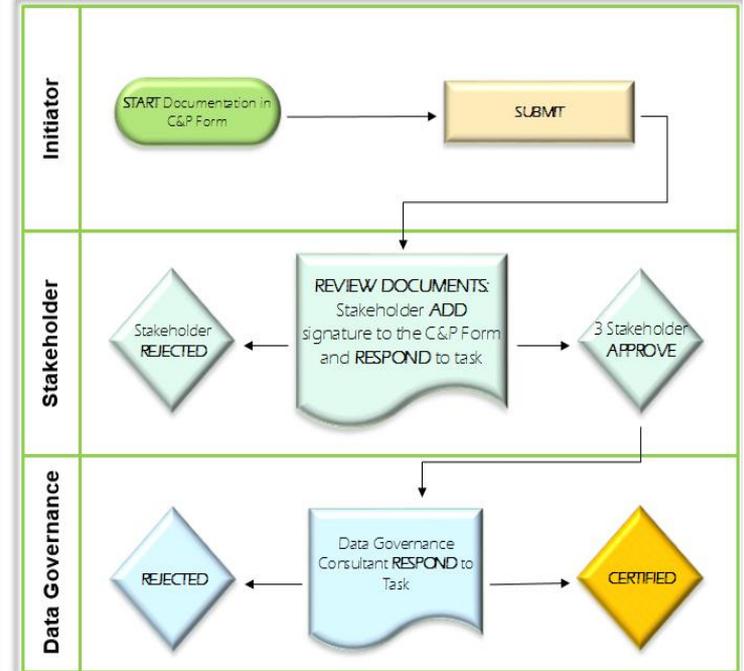
- Certification Levels

- Gold
- Silver
- Bronze

- Certification Drivers

- Initiator
- Stakeholders
- Data Governance

CERTIFICATION & PUBLICATION FORM	
Analytical Asset Name	<input type="text"/> A word or set of words by which the analytical asset being certified is known, referred to, or addressed.
Attachments	<input type="button" value="Click here to attach a file"/>
Analytical Asset Type	Metric <input type="text"/> Analytical assets are separate and distinct discrete units of information or decision-making tools. For example a data element and metric are distinct units of information whereas reports and dashboards are decision-making tools.
Analytical Asset Description	<input type="text"/> A detailed explanation highlighting the purpose and underlying concepts of the analytical asset so it is clear and comprehensible to the reader.
Analytical Asset Location	<input type="text"/> A detailed description or link to where the asset is located.
Analytical Asset Intended Usage	<input type="text"/> A detailed description of the planned insights drawn from the analytical asset.
Analytical Asset Calculation	<input type="text"/> A symbolic or written mathematical representation of the metric narrative.
Analytical Asset Inclusions	<input type="text"/> A detailed description of any data elements specifically included in the metric calculations. Used to inform others who may not be familiar with the data context.
Analytical Asset Exclusions	<input type="text"/> A detailed description of any data elements specifically left out of the metric calculation. Used to inform others who may not be familiar with the data context.



Community Knowledge & Culture

Knowledge Management

Community Engagement



Welcome to EADSpedia!

EADSpedia is intended to be a **one-stop shop for curated information around data, reporting, & analytics at UNC Health Care**. The success of EADSpedia relies on engagement from the entire analytics user community to provide content and share insights
****Please be patient with us and forgive our dust as we work diligently to build out this resource!**

Certified Analytical Assets

Review the analytical assets that have been submitted for Certification and their current status. If you have a request for an item to be certified, you can [submit it here](#).



Enterprise Analytics & Data Sciences EADSpedia

Analytical Asset Repository

new item

Status Presentation View All Items Find an item

ID	Analytical Asset Name	Analytical Asset Type	Strategic Pillars	Solution Area	EADS Certification Level
Status: Certified (73)					
57	Patient Mailing List Report (Professional Revenue Cycle)	Report	People	Finance & Revenue Cycle	Bronze
23	Hospital Revenue Cycle Denials Dashboard	Dashboard	Value	Finance & Revenue Cycle	Bronze
24	Denials Rate (Hospital Revenue Cycle)	Metric	Value	Finance & Revenue Cycle	Bronze
27	Preventable Denial Write-Off Rate (Hospital Revenue Cycle)	Metric	Value	Finance & Revenue Cycle	Bronze
45	Hospital Revenue Cycle Preventable Denial Write-Offs Dashboard	Dashboard	Value	Finance & Revenue Cycle	Bronze
105	Late Charges % (Hospital Revenue Cycle)	Metric	Value	Finance & Revenue Cycle	Bronze
48	226 (NQF 0028): Tobacco Use: Screening and Cessation Intervention	Metric	Quality & Service	Quality	Bronze
49	008 (NQF 0083): Heart Failure (H): Beta-Blocker Therapy for LVSD	Metric	Quality & Service	Quality	Bronze
50	023 (NQF 0239): Perioperative Care: VTE Prophylaxis (When Indicated in ALL Patinets)	Metric	Quality & Service	Quality	Bronze
51	032 (NQF 0384): Oncology, Medical and Radetion - Pain Intensity Quantified	Metric	Quality & Service	Quality	Bronze
52	143 (NQF 0384): Oncology, Medical and Radetion - Pain Intensity Quantified	Metric	Quality & Service	Quality	Bronze
53	131 (NQF 0420): Pain Assessment and Follow-Up	Metric	Quality & Service	Quality	Bronze



Analytics Community

Be a part of the community that helps drive content for EADSpedia through knowledge sharing, networking, and discussion. If you're an analyst or offer wear the "report-building" hat for your area, come be a part of the community!

Documentation

Search below or use this link to find information about a dashboard, report, Webl Universe, training, or something else.

Search...



Enterprise Analytics & Data Sciences EADSpedia

Hospital Revenue Cycle Denials Dashboard

ID Analytical Asset Type Business Point of Contact Technical Point of Contact EADS Solution Managers Strategic Pillars Solution Area EADS Certification Level EADS Certification Effective Date

23 Dashboard Davis, Jennifer (Denial Mgt) Dang, Liem McDaniel, Rebecca Value Finance & Revenue Cycle Bronze 10/25/2017

Background & Purpose

This dashboard was built by members of the Hospital Revenue Cycle ORBIT to give end users a summarized view of how a particular area is performing with regards to their denials rate and give visibility into trends and payor breakdown.

Industry Standard Alignment: The denials rate on this report relies on the HFMA guidelines around calculating a denials rate for hospital revenue cycle. For more information about this or other HFMA Map Keys: <https://www.hfma.org/NAP/Mapkeys/>

Dashboard Example:

REX HOSPITAL August 2017 Denial Rate

Denial Rate August 2017

Denial Rate	1.9%
Aug 17	5,753
Total Claims	43,261

Denial Rate Trend

Denial Rate

Denial Rate	1.9%
Denied Claims	62,276
Total Claims	454,529

Denial Rate Trend

Denied Claims & Total Claims

Denied Claims & Total Claims by Fiscal Year

2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027

19

A Word on Ethics

Data availability velocity > policy development velocity

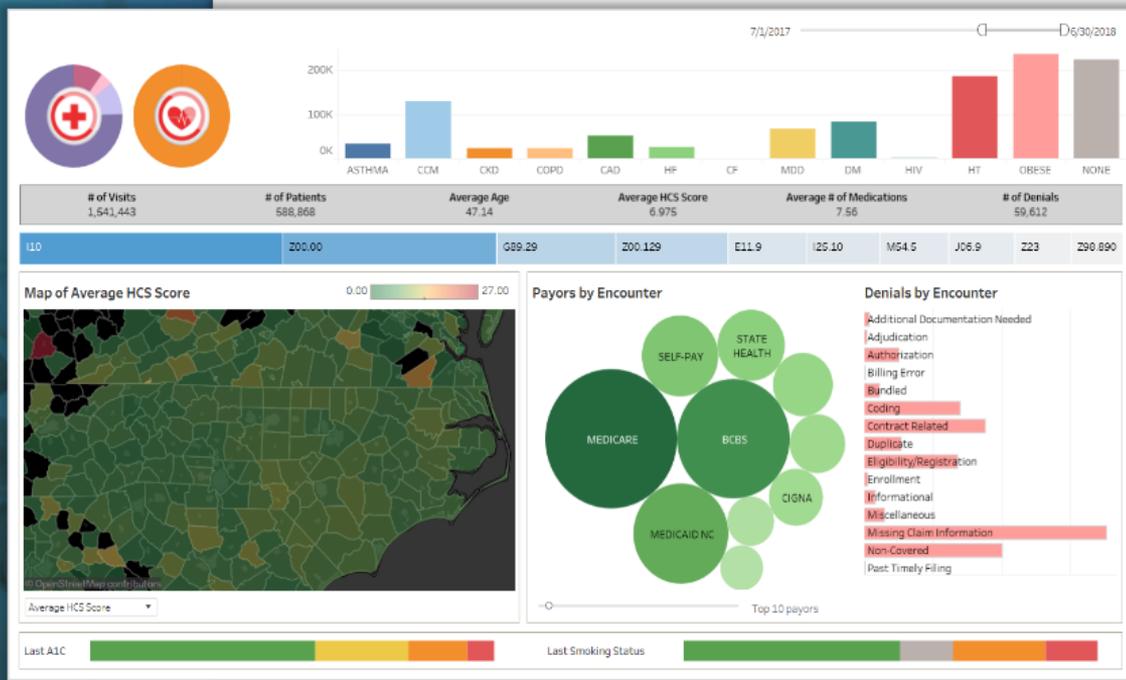
Obtaining multidisciplinary perspectives on a big data opportunity up front is critical to ensuring the right questions are being asked

Questions to ask as soon as possible:

- Who are the stakeholders for this work?
- Who has granted consent for this work, when, and why?
- What are potentially negative outcomes of this work, and who would be impacted (e.g., sponsors vs. owners vs. stakeholders)?
- If we told patients and/or physicians we were doing this, what would they think?
- Where is the line between “improvement” and “research”?
- What controls can be used to mitigate potentially negative impacts of this?



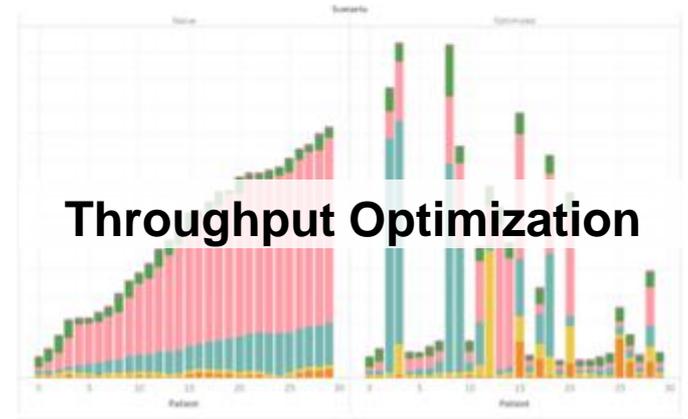
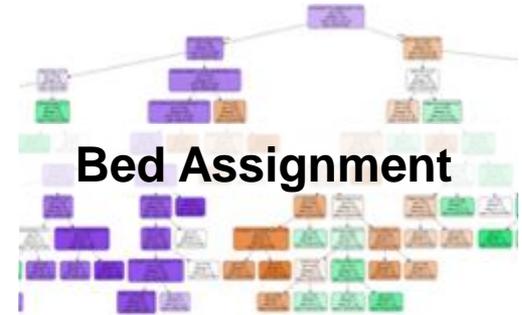
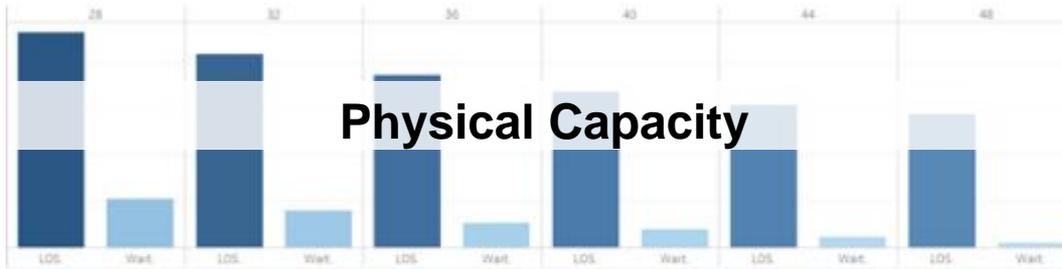
Example: Utilization Modeling



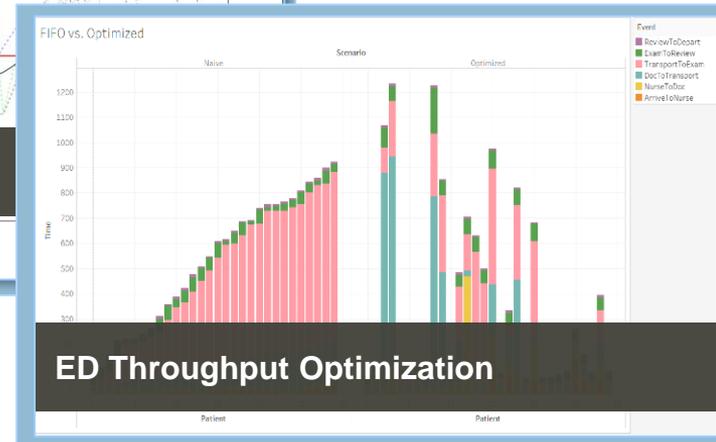
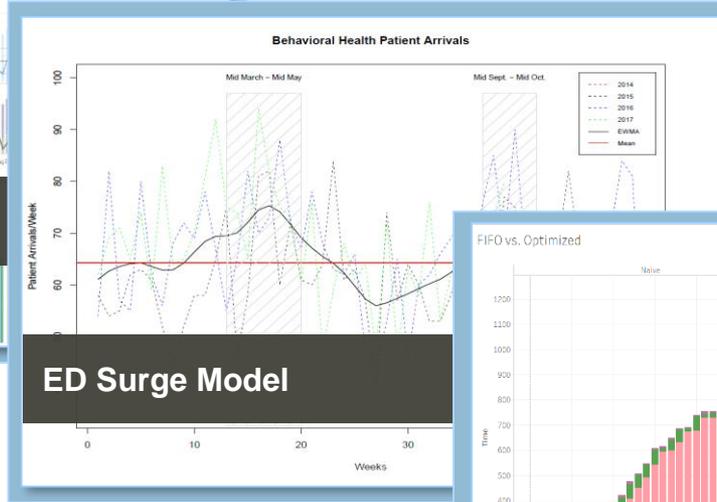
- Common views of health care system utilization through shared semantic representation
- Requires data domains through a more sophisticated data strategy linked to data governance

Example: Patient Throughput Optimization

Using discrete event simulation to drive operational efficiencies



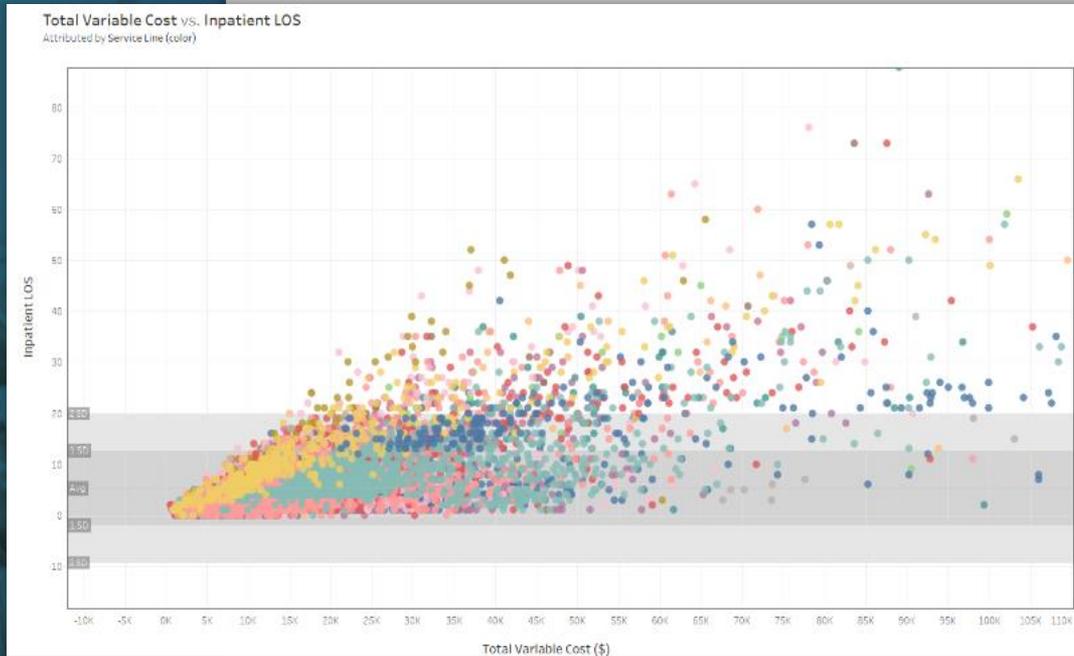
Example: Emergency Operations



- Models can be interpreted consistently despite different methods and focus

Example: Care Variation

Mapping clinical context to big data



- Individual diseases have disease-specific models
- Performance is defined against system-level standards
- Analytics are used to normalize comparisons

Do we care about “big data” or “big insights”?



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DATA Issues

Storage
Structure
Timeliness
Semantics & Language
Validity
Reliability
Triage
Pedigree

INSIGHT Issues

Innovation
Health Outcomes
Profitability
Productivity
Translational Science
Customer Intimacy
Risk
Value



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Summary

- 1. Deriving value from big data is about a lot more than traditional “data management”**
 - What we know about our data →
What we know from our data
- 2. Data governance is one of the key domains required to effectively operationalize big data**
- 3. Routine value creation from big data is dependent on growing and transitioning enterprise capabilities**
 - Reusable designs and assets
 - New process development
 - Business and clinical engagement
- 4. Governance programs need to be ever mindful of ethics considerations**
 - New data use is sometimes unplanned data use



Questions



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