



Managing Data as a Strategic Asset: Reality and Rewards

GTA Technology Summit 2015

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**Doug Robinson, Executive Director
National Association of State Chief Information Officers (NASCIO)**

About NASCIO

- National association representing state chief information officers and information technology executives from the states, territories and D.C.
- Founded in 1969
- NASCIO's mission is to foster government excellence through quality business practices, information management, and technology policy.





Fiscal recovery and IT budgets: CIOs still seeking IT operational **cost savings**, consolidation, innovations

Cybersecurity threats! New risks, governance is hard, funding inadequate

Transition: systems-centric *to* technology as a service

Project management, alternative **sourcing** options

Continuing IT **workforce** retirements, skills gap, recruiting challenges, talent management

Focus on **SMAC** stack: social, mobile, analytics, cloud

Top Ten: State CIO Priorities for 2015

1. Security

2. Cloud Services

3. Consolidation/Optimization

4. Broadband/Wireless Connectivity

5. Budget and Cost Control

6. Human Resources/Talent Management

7. Strategic IT Planning

8. Mobile Services/Mobility/Enterprise Mobility

9. Disaster Recovery/Business Continuity

10. Customer Relationship Management



B. Priority Technologies, Applications and Tools for 2015

1. Cloud Solutions; Software-as-a-service
2. Legacy Application Modernization/Renovation
3. Mobile Workforce: technologies and solutions
4. **Business Intelligence (BI) and Business Analytics (BA)**
5. Disaster Recovery / Business Continuity
6. Security Enhancement Tools: continuous diagnostic monitoring (CDM)
7. Virtualization: servers, desktop, storage, applications, data center
8. **Data Management: Master Client Index / Master Data Management**
9. Enterprise Resource Planning (ERP)
10. Networking (voice and data communications, unified)

The Reality of State Data Today



Government Data Landscape



Data stored across multiple systems from multiple agencies in multiple formats



Data quality issues: dirty and messy



Lack of standards, consistency



Data sharing is difficult – format, language, access, culture, myths



Security concerns and privacy issues



Little insightful, usable data on “customers”

Planning and Oversight of Large, Critical Projects

Sourcing

Managing Data as a Strategic Asset

Consolidation

Mobility

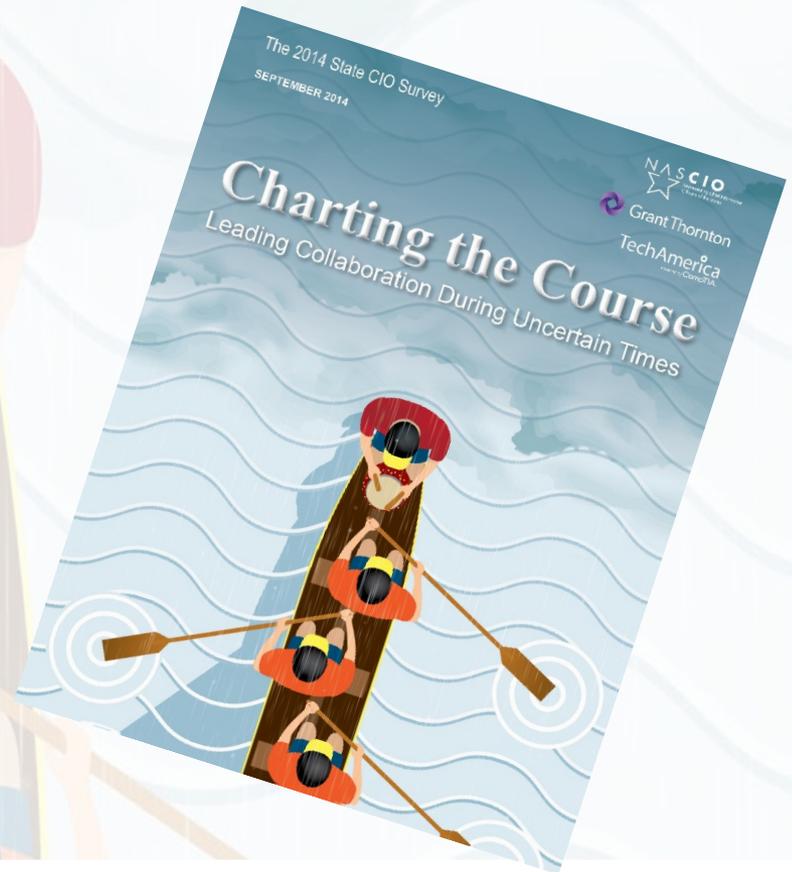
Cloud Services

Public Safety Broadband

Cybersecurity

Drones

Innovation



2014 State CIO Survey

Managing Data as a Strategic Asset

How would you characterize your data management function in terms of importance and maturity?

We have a long way to go to develop an enterprise view of data and governance of that data as a state asset.	26.9%
We have made some progress in developing an operating discipline for managing data.	53.9%
We have a formal data management discipline that includes governance, roles and responsibilities, and tools.	9.6%
We have a formal data management discipline that includes governance, roles and responsibilities, and tools. We are now moving toward data as an enterprise asset.	9.6%

Value of Enterprise Data



Data has been called the “currency” of government. This currency must be valued and managed as an enterprise asset



Not all data are created equal



Data value will vary depending on content, format, timeliness, quality and utility

Asset Management

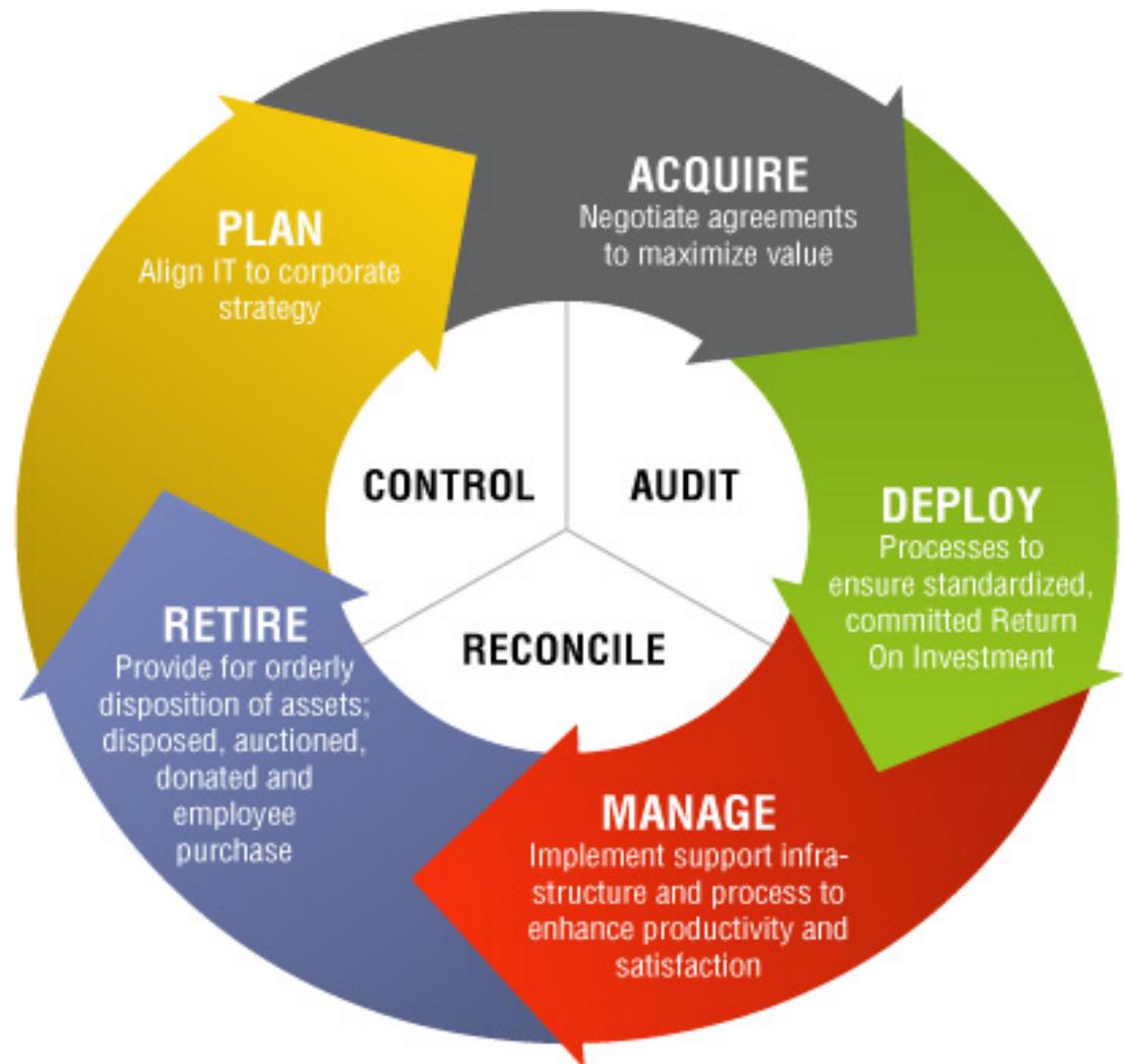
Asset management has become a priority at all levels of government and across government domains

However, the focus remains mostly on infrastructure, IT, physical plant, fleet and other “fixed” assets

Asset management strategies need to include information assets. Information should be managed, maintained and secured as a critical intangible asset.

Asset Management

Systems, infrastructure and processes for monitoring and maintaining an entity's assets through the entire lifecycle





Insights and Opportunities for States



Data mining to identify undiscovered patterns and establish hidden relationships

Data analytics seeks to uncover *insights* and provide understanding *quickly*

Using these tools with Big Data sources offers new capabilities and insights

High potential for improved service delivery, cost savings, operational improvement

The image shows the cover of a research brief from NASCIO. At the top left is the NASCIO logo (a green star with 'NASCIO' text) and 'University of Virginia Center for Public Programs'. At the top right is 'NASCIO Research Brief | FEBRUARY 2010'. The main image is a photograph of three business professionals in suits looking at a tablet. Below the photo is the title 'DO YOU THINK? OR DO YOU KNOW?' in green and black, followed by the subtitle 'Improving State Government Operations Through Business Analytics'. The main content area has a light blue background with the heading 'INFORMATION OVERLOAD – THREATS AND OPPORTUNITIES'. The text discusses the growth of data and the challenges it poses for state governments. A bulleted list follows, detailing various data-related trends. On the right side, there is contact information for Eric Sweden, NASCIO Senior Enterprise Architect, and the NASCIO office address in Lexington, KY. At the bottom right, there is a copyright notice and the 'NASCIO Series on Analytics' logo.

NASCIO
University of Virginia
Center for Public Programs

NASCIO Research Brief | FEBRUARY 2010

DO YOU THINK? OR DO YOU KNOW?
Improving State Government Operations Through Business Analytics

INFORMATION OVERLOAD – THREATS AND OPPORTUNITIES

It is no surprise that the amount and diversity of data that is collected by state government continues to grow. As large enterprises, state government organizations reflect the global trends in data growth. IBM estimates that worldwide data volumes are doubling every two years.¹ State government is already challenged with the nominal growth in data because of new programs, program expansion, citizen demands, regulations and legislative mandates. It is anticipated that traditional structured data volumes will grow. However, the advent of new data streams and types of data can be expected to far surpass early estimates in nominal data growth. Some of the contributing factors include:

- The growth of “born digital” content and reliance on email for conducting the business of government
- Legislation calling for more performance measurement, metrics tracking, and more information sharing
- The drive and demand for greater government transparency including the collection and reporting of new types of data (e.g., ARA of 2009, section 1512)
- The growing ubiquity of digital surveillance within public safety
- The burgeoning number of sensors and automated devices with data feeds
- More mobile devices such as personal digital assistants (PDAs)
- More geospatially enabled devices and the need track and store movement data
- Expanding volumes of Large Objects (LOBs) such as videos, images, audio?

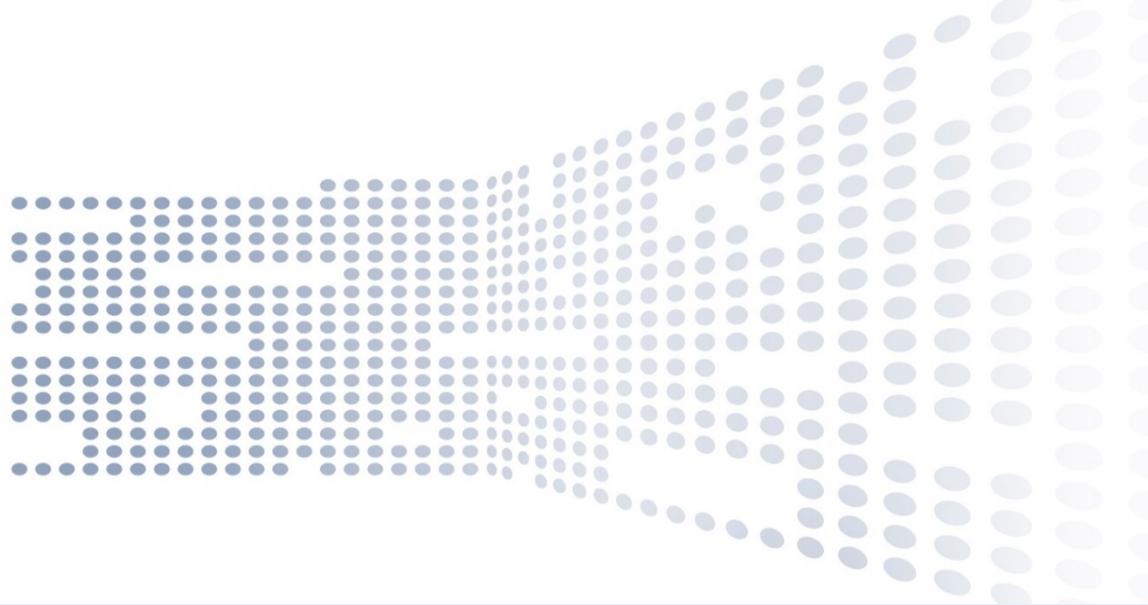
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NASCIO represents state chief information officers and information technology executives and managers from state governments across the United States. For more information visit www.nascio.org.

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NASCIO
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Analytics



From the enterprise perspective, what is the current utilization and deployment of BI/BA and data analytics within your state government?	2011	2013	2014
State is already highly invested and has substantial capabilities	12%	10%	16%
State has some capabilities in certain agencies	54%	65%	69%
State is still investigating solutions	22%	15%	8%
State has no investment	12%	6%	8%

Few states are “highly invested” in data analytics capabilities today

Successful, but tactical implementations in agencies

Primary focus on fraud, abuse, improper payments, recovery

General lack of strategic focus, enterprise orientation, data architecture, privacy impacts



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Is Big Data a Big Deal for



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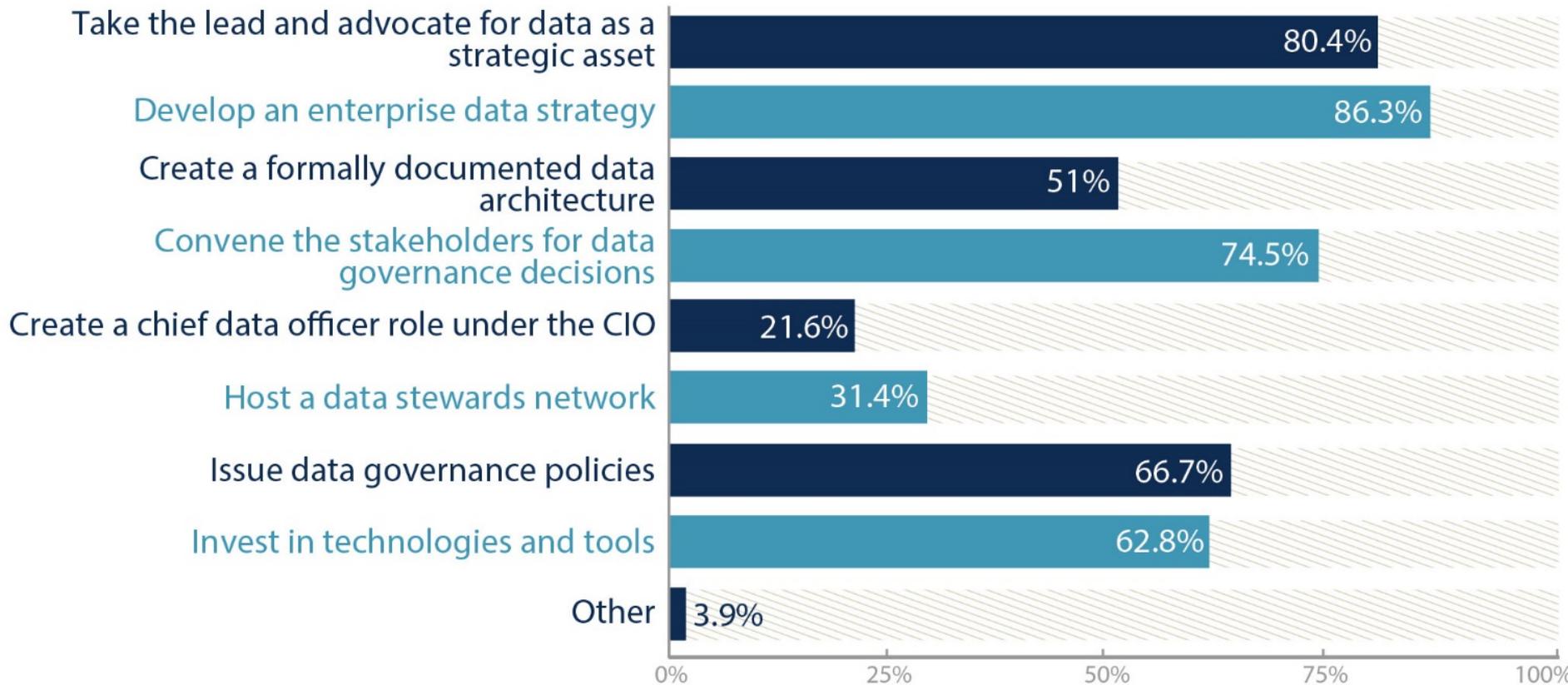
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Enterprise Data Management

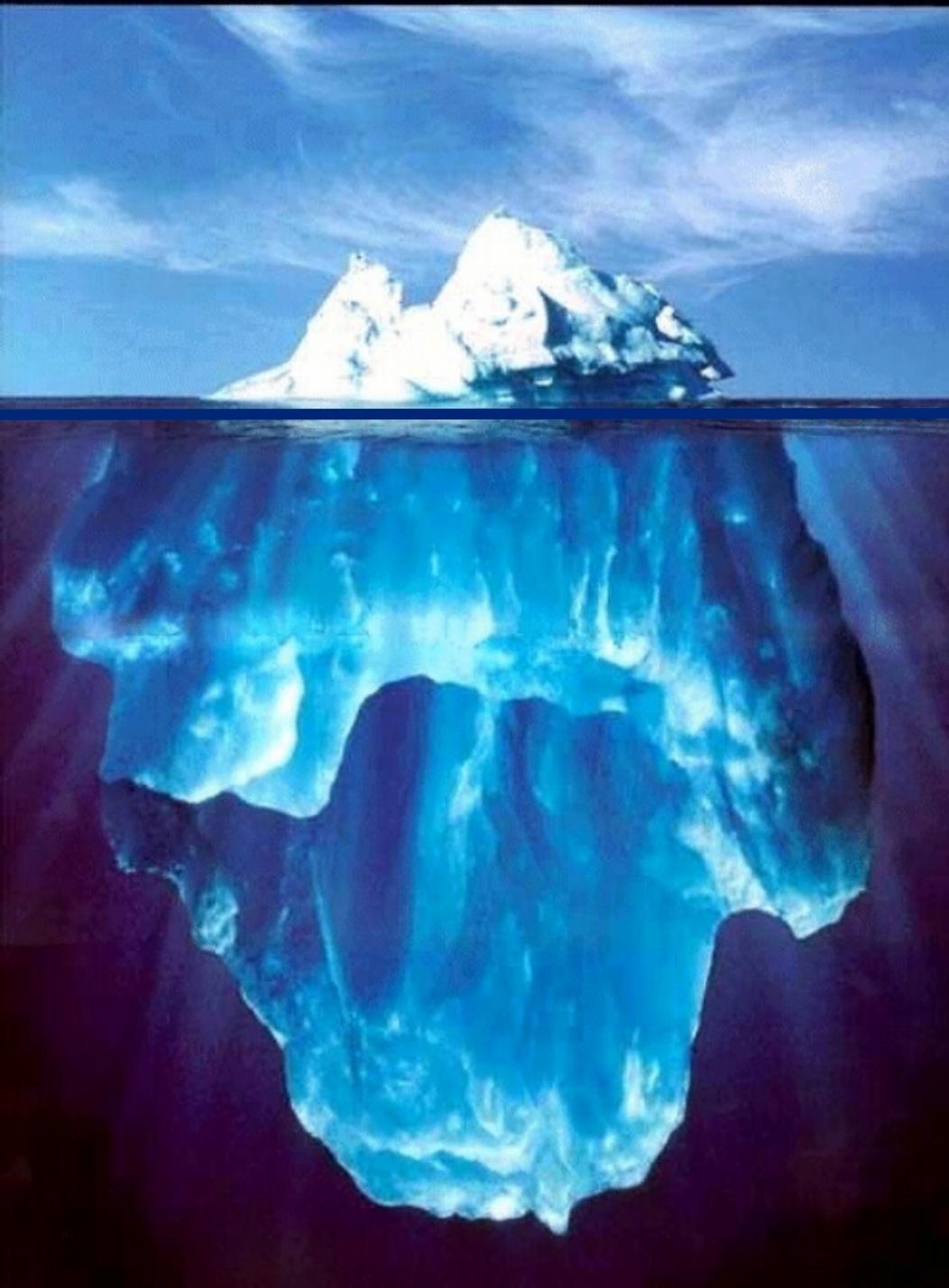


What is the appropriate role of the State CIO organization in enterprise data management?



Opportunities in the States

- KY uses data mining and analytics to track controlled substance usage patterns and develop predictive geographic models to focus resources on “hot spots”
- MI uses data analytics and case management to reduce unemployment fraud and overpayments
- NC uses mining and analytics to combat Medicaid abuse and netted more than \$20 million in just five months
- NY state has saved more than \$1 billion in 10 years with an analytics program designed to spot tax cheats



Major Changes in State Data

Structured

Semi-structured

Unstructured

**Sources and Format
Changing Dramatically**

Characteristics of Big Data



Analytics and Big Data: High Value Targets

1. Human Services
2. Healthcare
3. Revenue and Taxes
4. Finance, Administration, Procurement
5. Transportation
6. K-12 Education
7. Labor and Unemployment
8. Justice and Law Enforcement
9. Economic Development
10. Higher Education

BIG Data. BIG Possibilities. BIG Challenges.

The government can use Big Data to save money, improve service quality and ultimately improve citizens' lives, particularly in health and public safety.¹ Practical barriers to government adoption of Big Data solutions must be overcome to realize these benefits.

THE POTENTIAL

83% of federal IT officials
Real-Time Big Data offers government substantial savings
Big Data can save more than 30% from the federal budget
\$380B ↔ \$1,200 per American

Real-Time Big Data can save lives
87% of federal and 75% of state IT officials believe real-time Big Data has the potential to save a significant number of lives

- Identify areas where real-time aggregation of information about treatments administered to avoid further treatments
- Publicize real-time Big Data to identify areas with the greatest potential to save lives
- Big Data can help emergency officials find and prevent safety hazards before they become emergencies

THE BARRIERS

47% of federal IT officials
Citizen's privacy and policy concerns

39% of federal IT officials
High costs

42% of federal IT officials
No clear ROI

32% of federal IT officials
Overwhelming volumes of data

40% of federal IT officials
Database queries take too long

75% of federal IT officials
Big Data can help improve the quality of citizens' lives

61% of state IT officials
Big Data can improve social and welfare services

43% of federal IT officials
Limited group has access to data

While Big Data has great potential to make governments more efficient and effective, there are practical and perception hurdles to clear. Chief among these is ensuring that their data are safe and protected. But government and citizens stand to benefit from streamlining energy production to increasing

- **Substantial budget cuts:** detecting improper healthcare payments before they occur
- **Lifesaving potential:** aggregate information about healthcare outcomes to reveal patterns
- **Crime reduction:** Police using Big Data technology to develop predictive models about when and where crimes are likely to occur
- **Enhanced quality of life:** gaining insight into huge volumes of data across agencies, the government can provide improved, personalized services to citizens

Source: Big Data and the Public Sector, TechAmerica Foundation



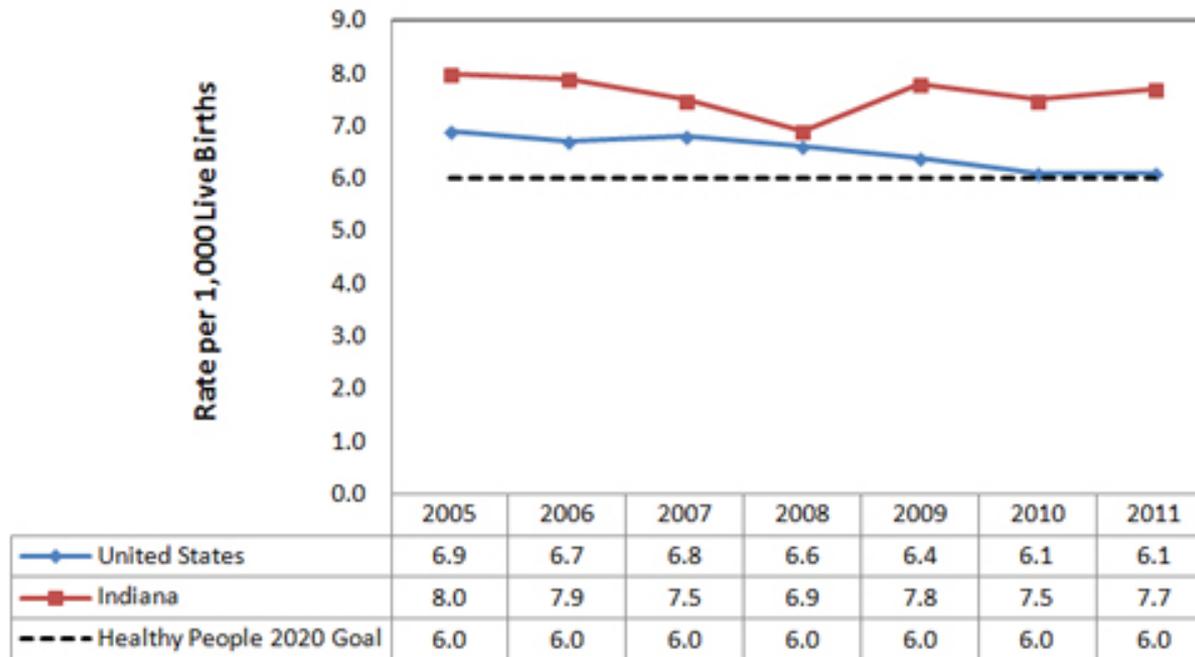
How would you describe the status of Big Data in your state?

The state is still investigating opportunities for big data	41.2%
Big data underway project in one agency	7.8%
Big data project underway involving multiple agencies	13.7%
Several big data projects underway	11.8%
No activity at this time	21.6%
Don't know	3.9%

Indiana: Can Big Data Reduce Infant Mortality?

- Gov. Pence executive order creating a Management and Performance Hub (MPH) for all agencies
- Coordinated effort among the state's agencies, the Indiana OIT and state OMB
- MPH provides centralized data sharing, correlation and analysis for the state in areas where multiple agencies must work together
- Initial focus: a major public health issue in Indiana

Infant Mortality Rates, United States & Indiana, 2005-2011



Source: Indiana State Department of Health, Maternal & Child Health Epidemiology Division (August 12, 2013)
 United States Original Source: Centers for Disease Control and Prevention National Center for Health Statistics
 Indiana Original Source: Indiana State Department of Health, PHPC, ERC, Data Analysis Team

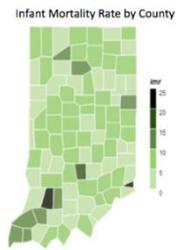
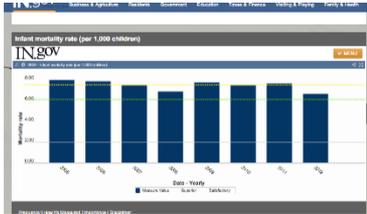
Pilot: Reduce infant mortality; data from multiple state agencies

Combine 50-60 disparate databases for analytics and new insight

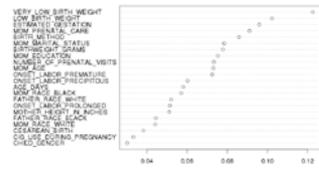
Progress: Building & Using the Solution

Before

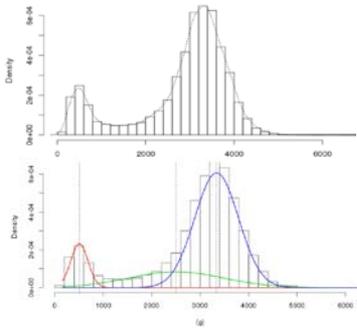
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Statistically quantified importance of risk factors—many of which had never been considered by health professionals

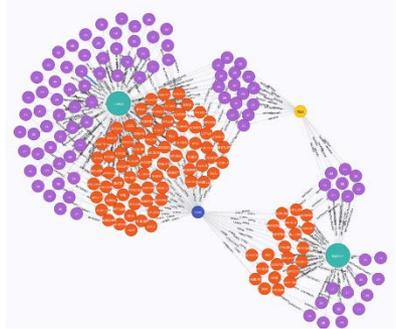
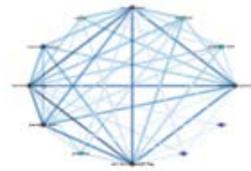


There are infant subpopulations with distinct quantifiable, predictable underlying drivers for death



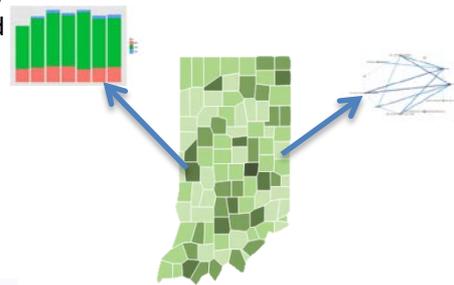
After

Establish correlation frequency between known and previously unknown risk factors (STDs and STDs to deaths)

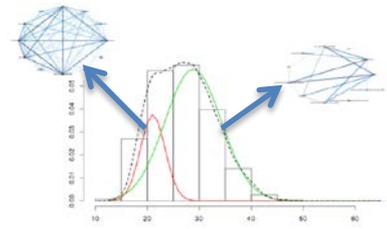


Understand the complicated "human factors"

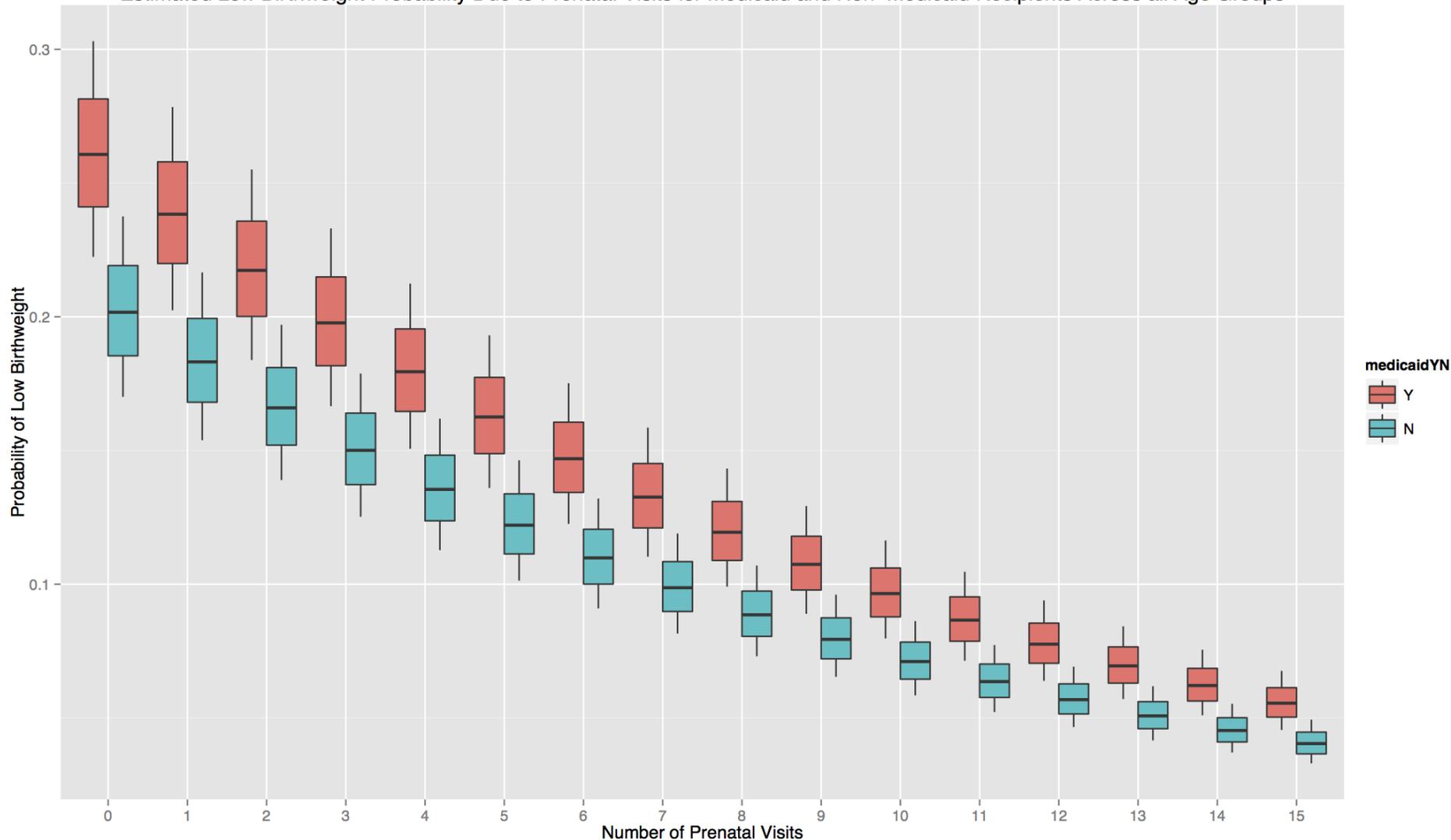
Regions have distinct needs based on population demographics, industry, access to care, etc.



Different subpopulations of mothers have distinct risk profiles and needs



Estimated Low Birthweight Probability Due to Prenatal Visits for Medicaid and Non-Medicaid Recipients Across all Age Groups



What did Indiana discover from Big Data analytics?

Managing Data: Looking Ahead...

Need enterprise imperative and governance

Inventory data systems across the enterprise to identify the array

Understand security and privacy implications

Data Divide: The Rise of Data Poverty

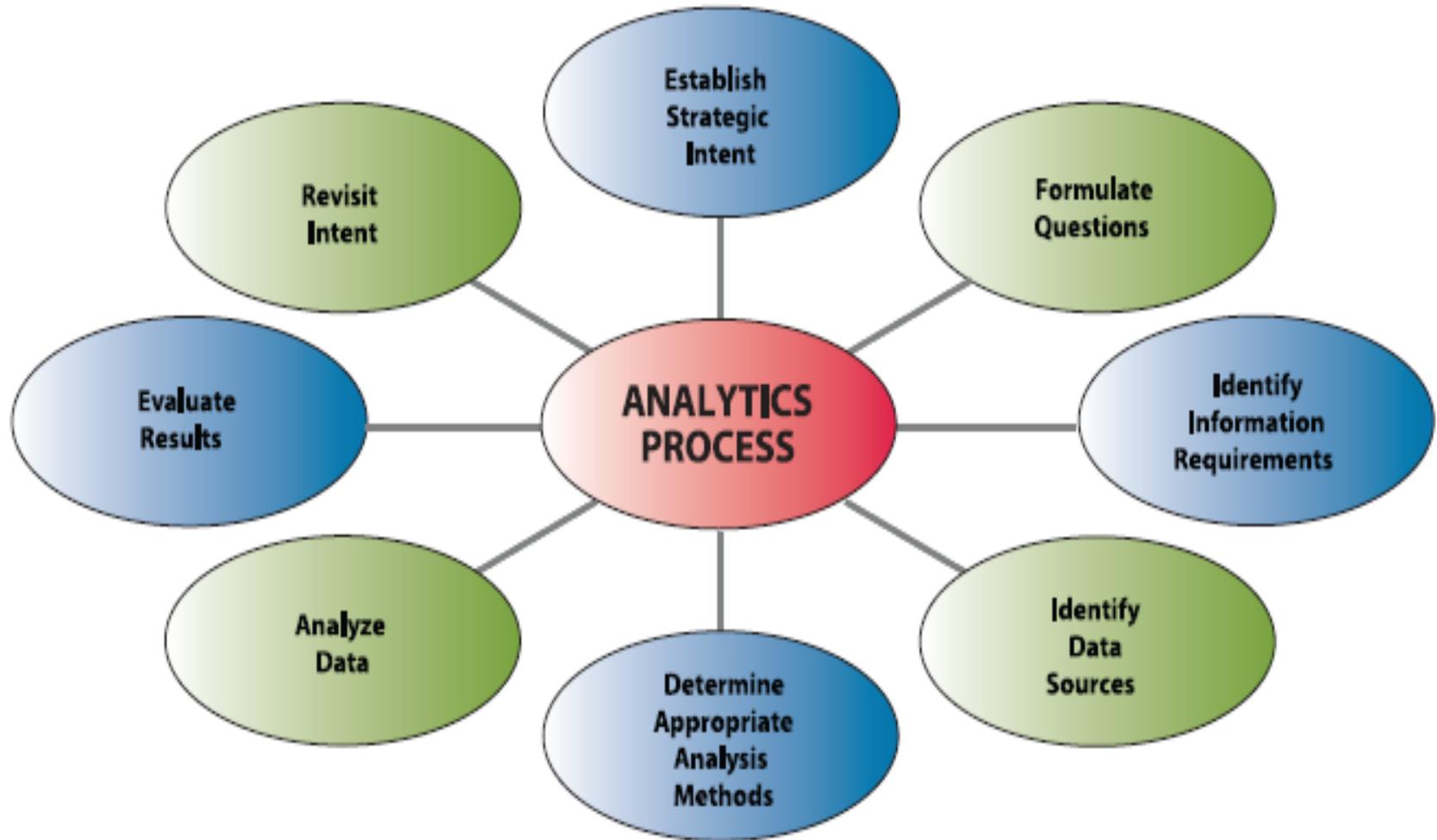
Power of visualization and dashboards for transparency

Challenges with state skill sets, competencies, recruiting

Expect surprises and unintended consequences!

Information Asset Portfolio

States Need Intent, Architecture, Policies, Processes and Methods to be Successful



Managing Data: Looking Ahead...

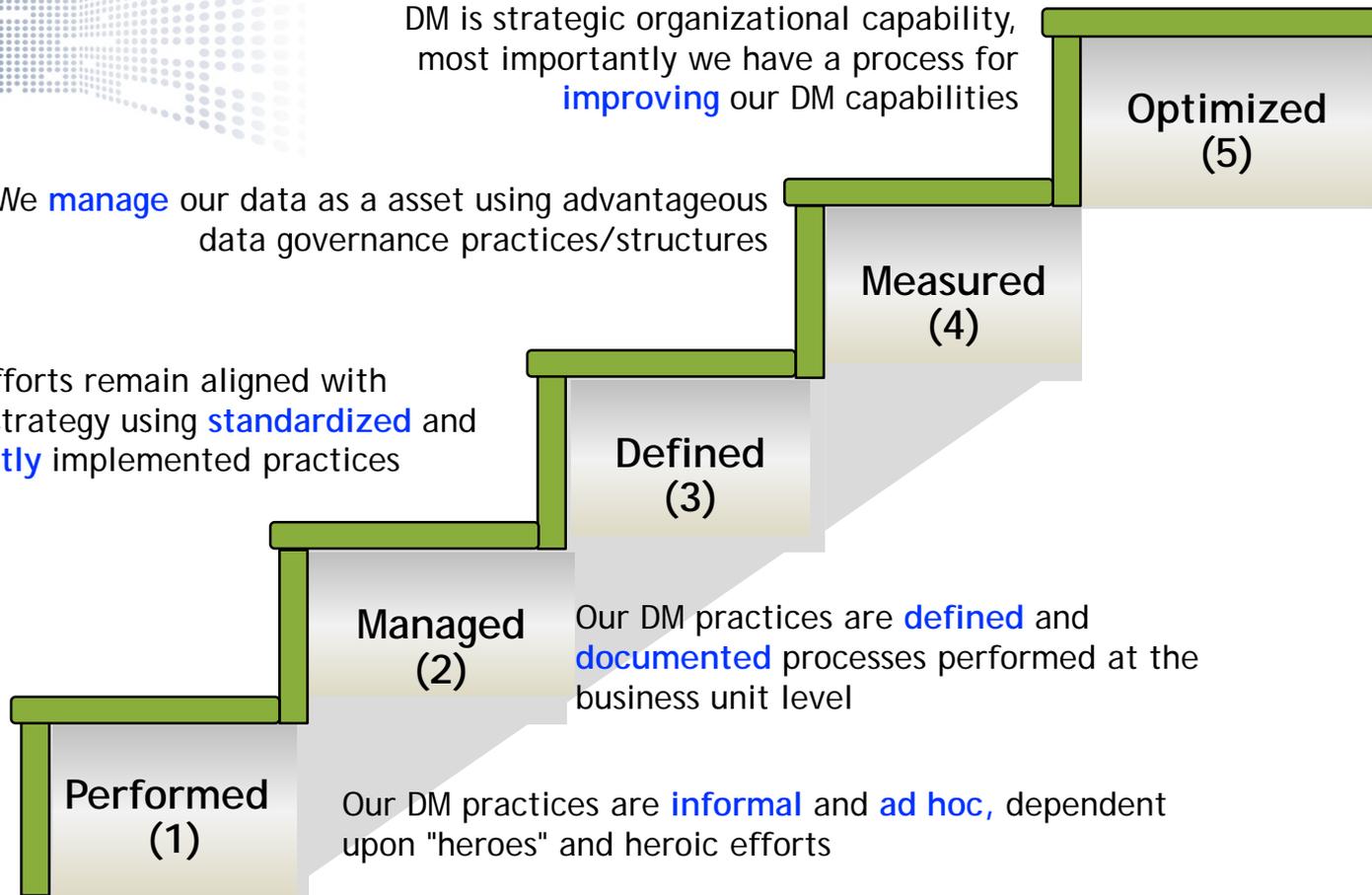
DMMSM Capability Maturity Model Levels



DM is strategic organizational capability, most importantly we have a process for **improving** our DM capabilities

We **manage** our data as an asset using advantageous data governance practices/structures

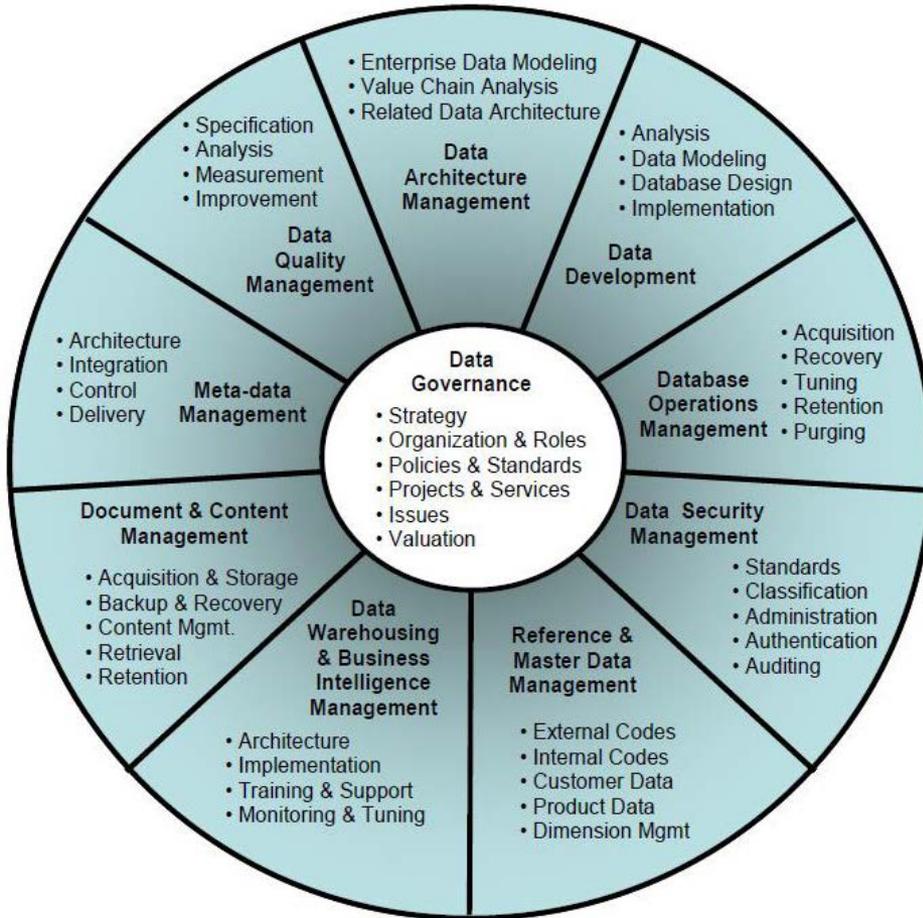
Our DM efforts remain aligned with business strategy using **standardized** and **consistently** implemented practices



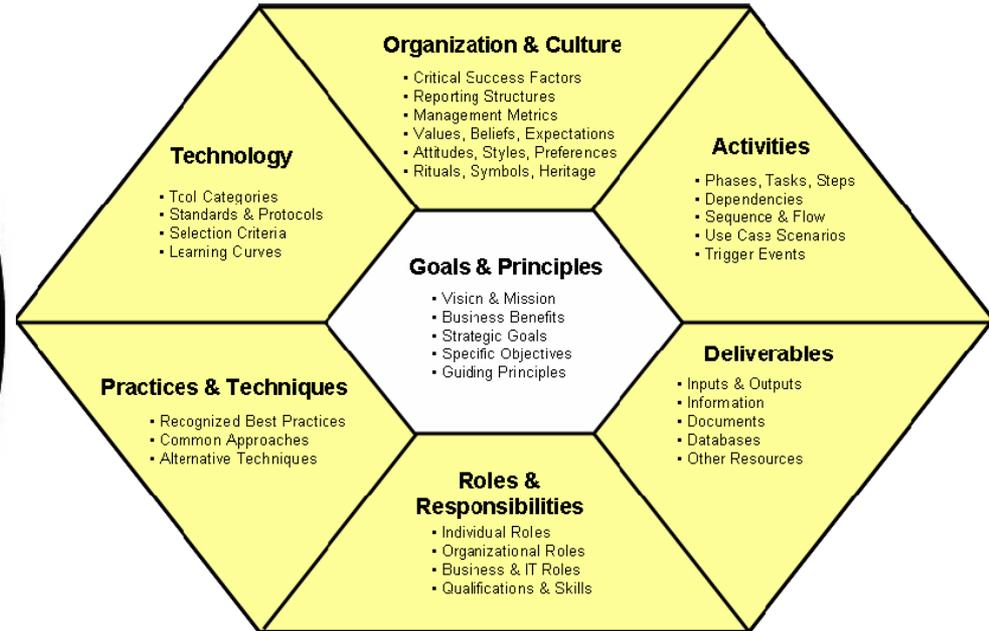
Our DM practices are **defined** and **documented** processes performed at the business unit level

Our DM practices are **informal** and **ad hoc**, dependent upon "heroes" and heroic efforts

The DAMA-DMBOK Functional Framework



Functions



Environmental Elements

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