

Data Management Fundamentals

It's All About The Data Workshop

himss
CENTRAL & NORTH FLORIDA *Chapter*

South University, Tampa, FL

May 3, 2019



IMMERSIVE

PRESENTER



Dan Rounds
President

Dan is the President of Immersive, a healthcare data lifecycle firm serving organizations throughout the healthcare ecosystem. With over 20 years of experience, Dan leads all aspects of strategy and operations. He is an advisor, strategist and architect to their clients with expertise in data/info governance, data management, interoperability, analytics, and regulatory compliance.

Prior to Immersive Dan was CEO of Noesis Health, a national healthcare consultancy. He continued as a Partner in Santa Rosa Consulting following their acquisition of Noesis in 2009. Dan has held other key leadership roles at iSirona (now NantHealth), CTG Healthcare Solutions and MedPlus (Quest Diagnostics).

PRESENTER



Stephanie Crabb
Principal & Co-founder

Stephanie is Co-Founder and Principal at Immersive, a healthcare data lifecycle management company where she leads program and solution development, knowledge management and customer success. Stephanie brings 25 years of experience in the healthcare industry where she has served in program/solution development, client service and business development roles for leading firms including The Advisory Board Company, WebMD, CTG Health Solutions and CynergisTek. She has led a number of program and product launches with an emphasis on competitive differentiation, rapid adoption, client satisfaction, and strategic portfolio management.

Stephanie holds her A.B. and A.M. from the University of Chicago. Stephanie serves as the Scholarship Chair of CNFLHIMSS, on AHIMA's Data Analytics Practice Council and recently completed a two-year term on the Advisory Board of the Association for Executives in Healthcare Information Security (AEHIS) of CHIME.

Learning Objectives



Explore the data and information management landscape – what surveys and practice are telling us



Understand the value (or not) of frameworks, models and organizational structures for data management



Enumerate “most valued” and “most challenging” data management functions and what’s driving the effort



Where to focus to get the highest reward...short- and long-term

AGENDA



- ❑ The Healthcare Data and Information Landscape
- ❑ Data Management Fundamentals
- ❑ Operationalizing Data Management to Maximize Gains
- ❑ Discussion and Wrap Up

Healthcare Data and Information Landscape



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76 BPM

Lofty Ambitions. Tactical Urgency.



Cost of Care



Quality, Decision Support and Outcomes



Population Health



Personalized Medicine



Care Management & Patient Engagement



Research



Patient Experience



Digital Transformation



Regulatory Compliance



Patient Safety

What the Surveys Say...

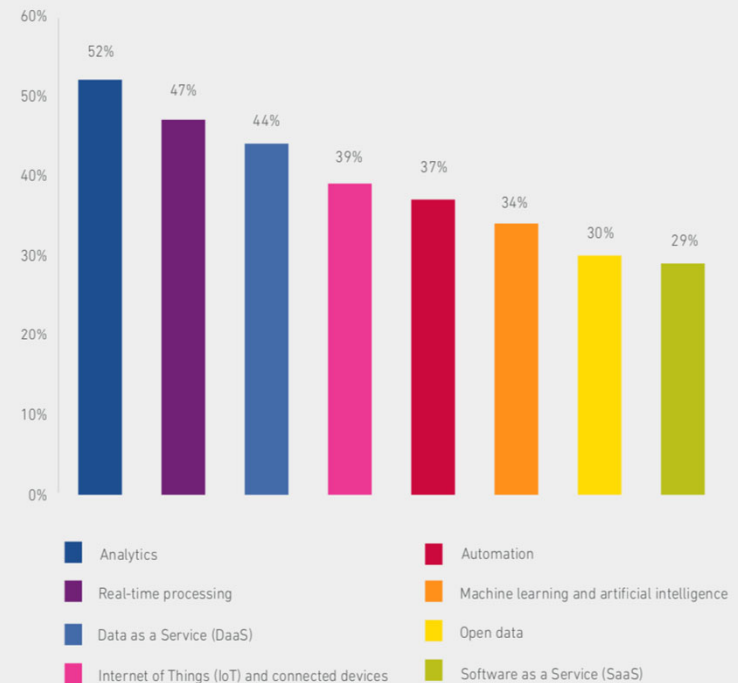
Healthcare views its data-enabled opportunities similarly to those of other industries

Real-time processing is critical to timely decision-making, patient safety, etc.

DaaS is more than just offloading data to the cloud – it is about data quality and data access – both paramount as healthcare moves increasingly to self-service analytics

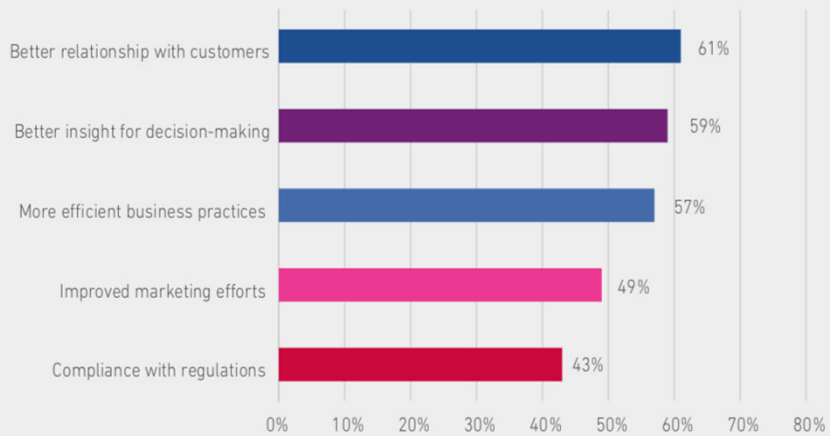
IoT/Connected Devices are healthcare's primary path to patient engagement/experience and personalization

Chart 1
Top data-enabled business opportunities



U.S. data, 2018

Chart 3
Areas of strategic competitive advantage



U.S. data, 2018

What the Surveys Say...

Data is no longer viewed as "nice to have" but critical to competitive advantage

The competitive landscape in healthcare is being shaped, in part, by a new data and digital economy

Data Is Challenging

Why is healthcare data so complex and difficult to manage?



Complexity

claims data, clinical data, myriad variables related to an amalgam of systems, shifting business rules and conflicting definitions



Format

text, numeric, paper, digital, images, multimedia, video...and the same data can exist in different systems in different formats



Structure

structured vs unstructured - despite best efforts to leverage the EMR as a platform for consistent data capture



Definitions

inconsistent, variable and subjective definitions based on the source...and new knowledge keeps this target moving



Location

healthcare data tends to be created and reside in multiple places



Regulatory Requirements

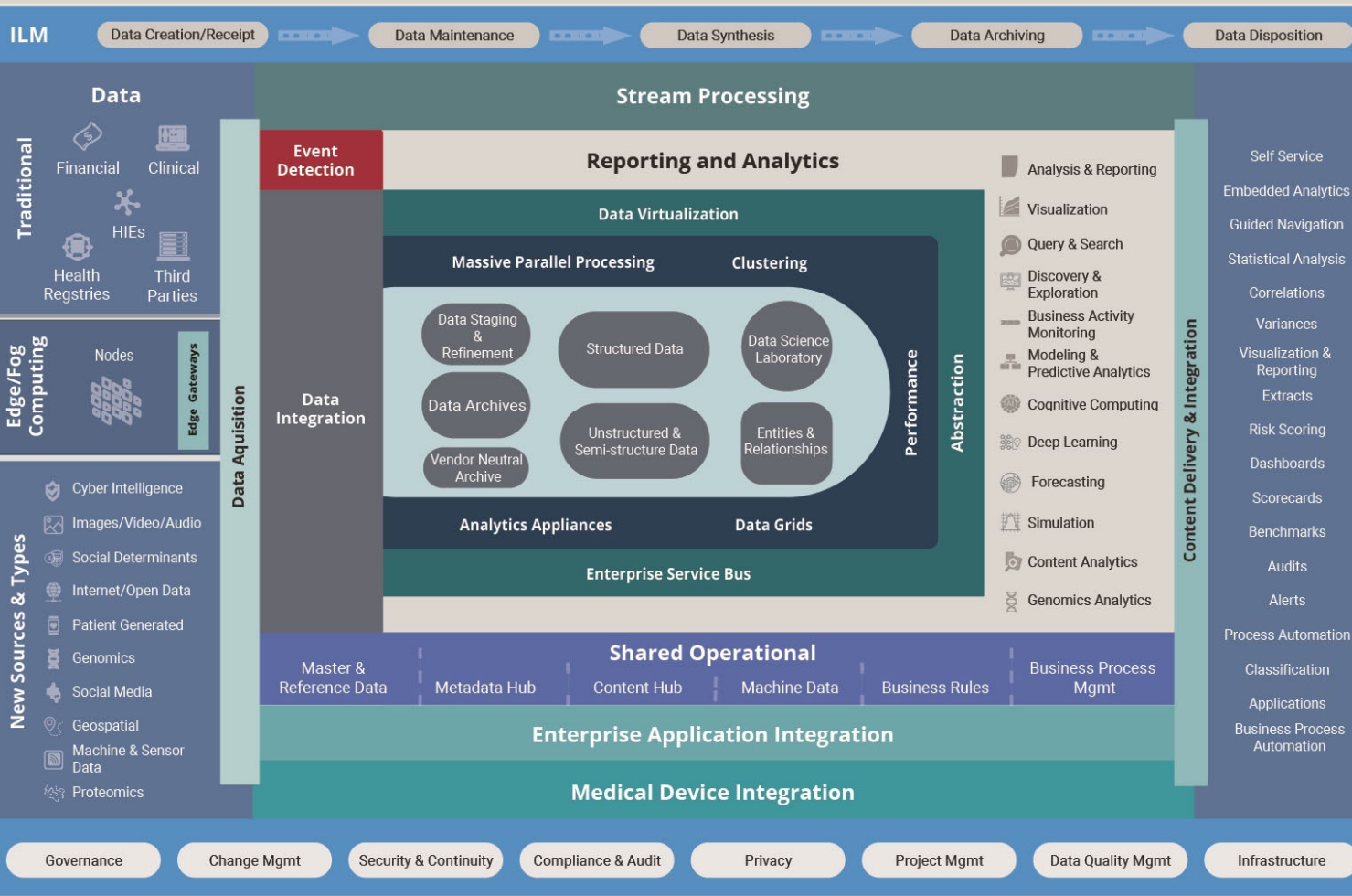
despite the shift to reduce reporting burdens, the rise of data and analytics will likely translate into different regulatory requirements – there may be less of them, but likely more complex



Data Management Reference Architecture

clarityDG™

clarityDG™



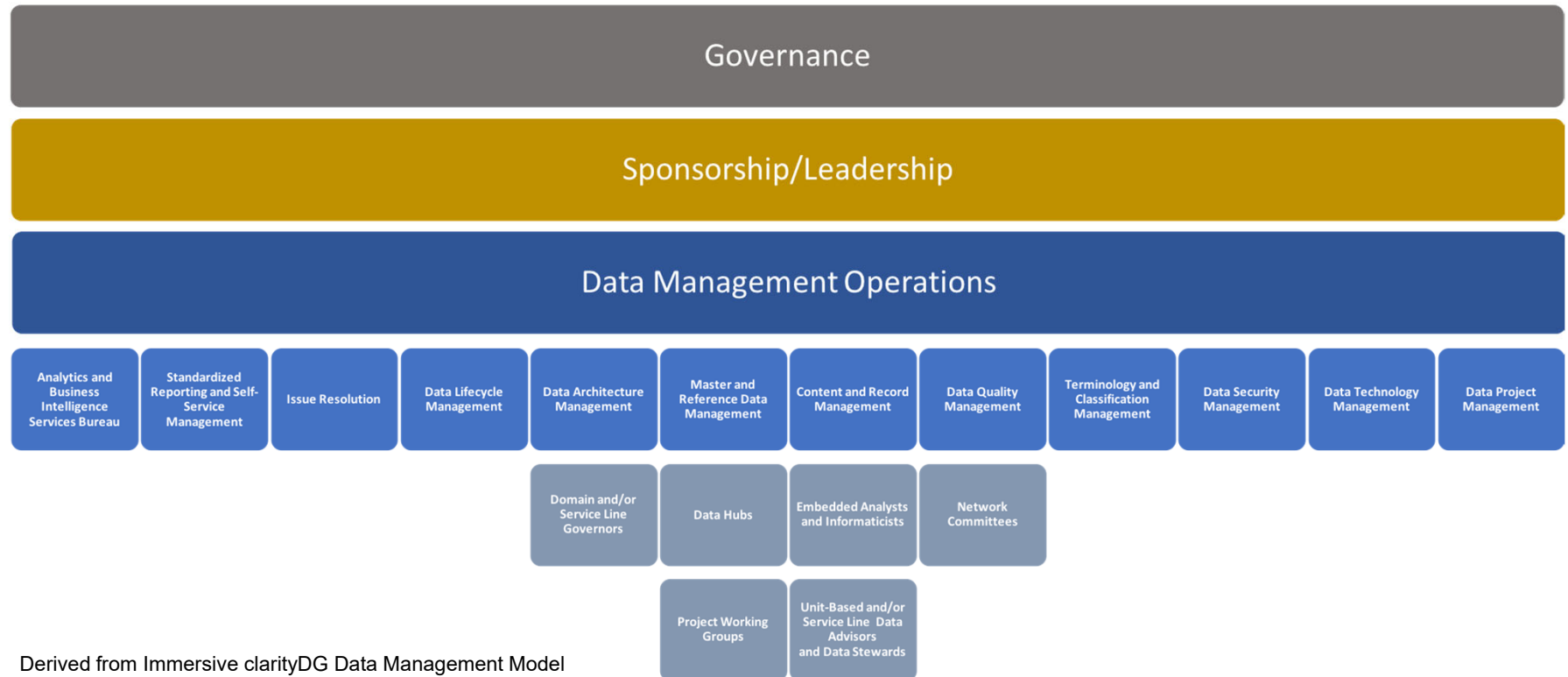
Data Is Challenging

...the inputs, outputs and processes that comprise the modern healthcare data architecture are very complex



Data Management In The Organization

Data Management is Not a Mature Discipline for Most



Derived from Immersive clarityDG Data Management Model

What We See: People

❑ Resources and Roles

- roles creation/dedication for BI, data science
- roles not being created/dedicated for all data management functions
- data management functions are “a part” of someone’s job but not always well defined/clarified

❑ Old School, New School

- “analyst” does not necessarily mean what it used to or what we need it to be

❑ Talent Management

- lack programs and pathways to grow internal talent into roles of the future
- scarcity of resources

❑ Workforce Engagement and Enablement

- Lack awareness and training content on data management in our workforce education/training plans



What We See: Process

❑ Governance

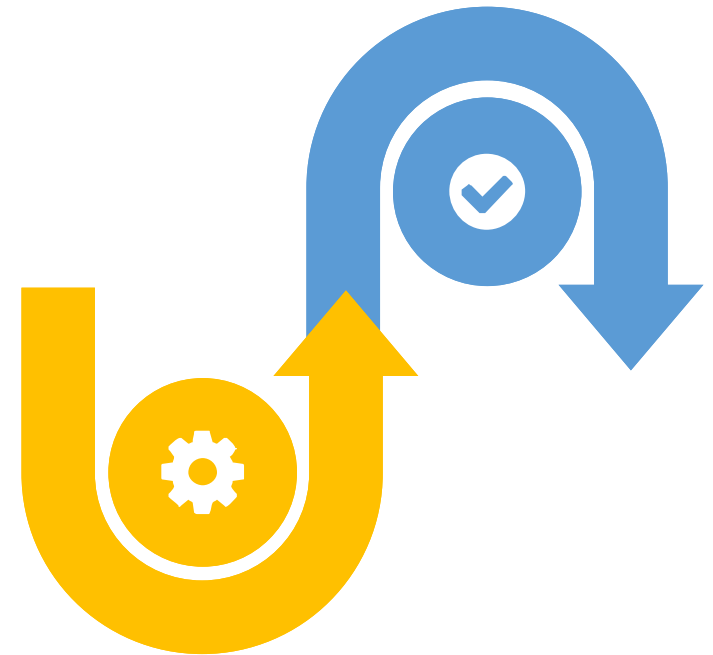
- 40% of providers have adopted enterprise DG
- 20% of providers have adopted DG at departmental level
- 40% of providers are exploring or not pursuing DG
- DG means different things to different organizations

❑ Framework/Standards Adoption

- limited evidence of framework adoption for data governance, data maturity, data quality
- limited evidence of standards adoption to promote data quality, usability, interoperability

❑ Data Management Operations

- largely “ad hoc” at the enterprise level except for better organization around analytics
- driven from and within IT in most organizations but increased engagement from ACEs, CDOs and PopHealth
- highly variable data management practices within business units and departments





**IT
Governance**

Architecture

**Regulatory
Compliance**

**Information
Governance**



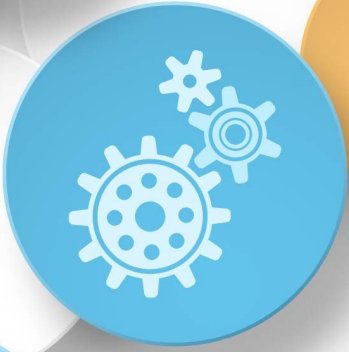
**Risk
Management**



**Framework
Development**



**Data
Governance**



Cybersecurity

Corporate



Frameworks & standards exist.
But what about adoption?

What We See: Technology



EIM Roadmap

few organizations have a thoughtfully constructed roadmap for EIM technology



It's all about Analytics

prioritized investments in analytics at the expense of other foundational data management technologies

lack of understanding re: technologies that are essential to prepare/maintain data for productive use



“Haves” and “Have Nots”

inconsistent availability of tools and technology across business units resulting in inconsistent output

variable adoption of and support for “self-service analytics”



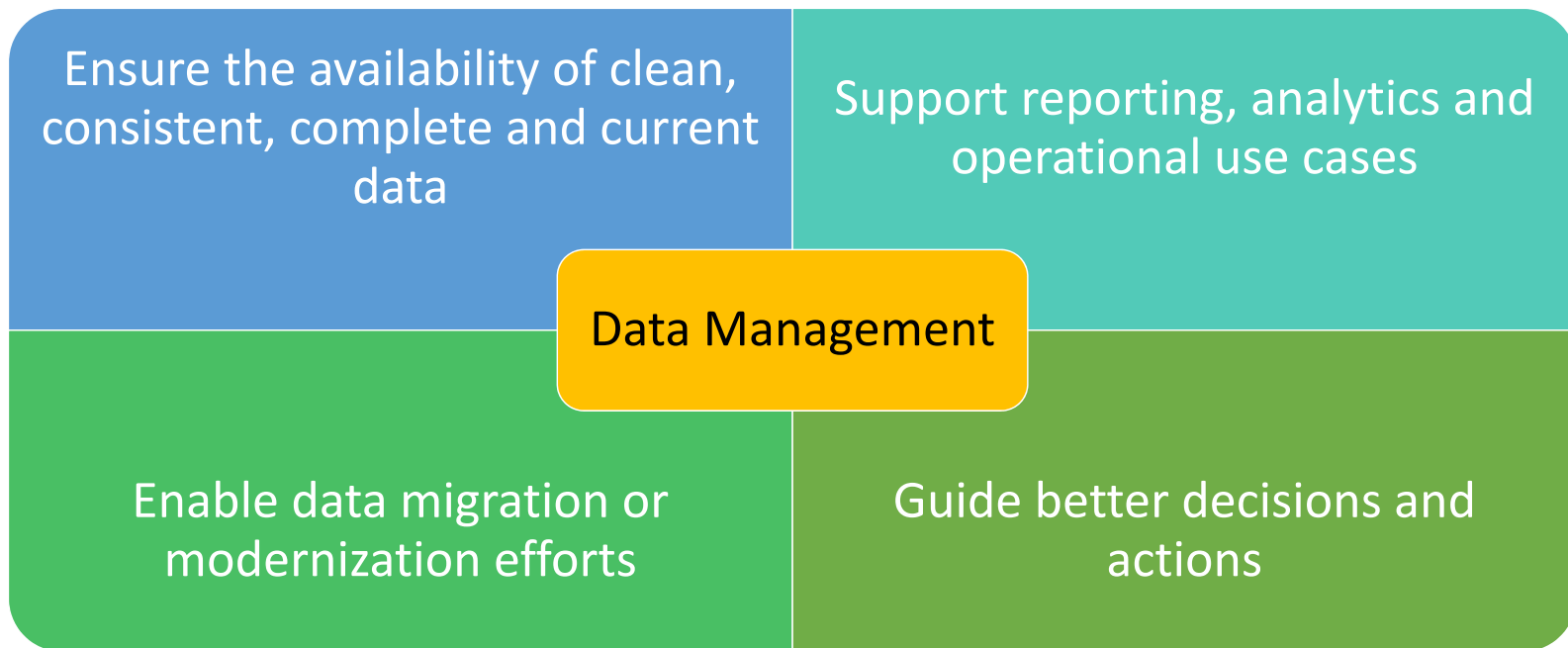
Suboptimal Use/Procurement of Technology

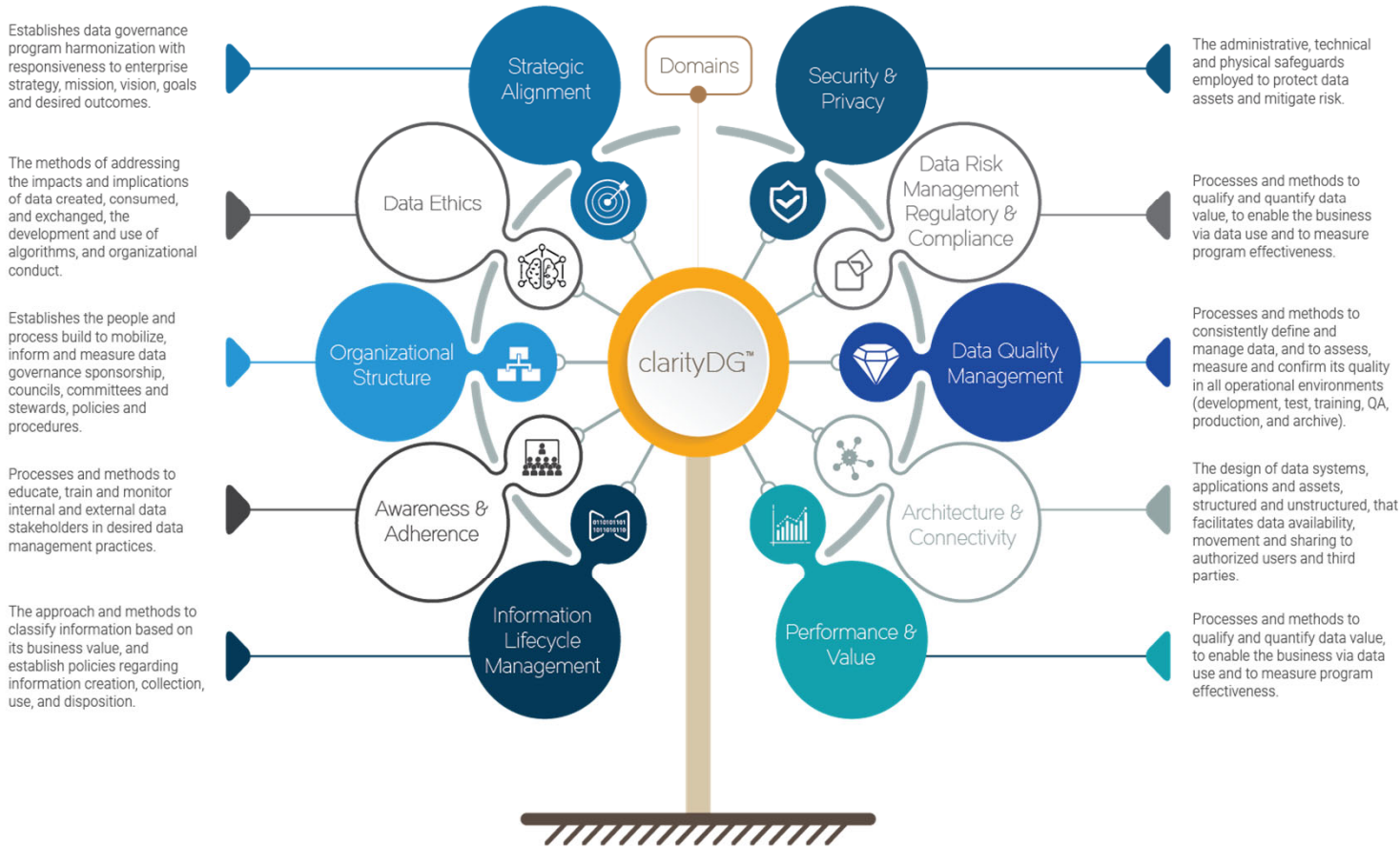
silos/focused use of technology creates blind spots for broader uses

Data Management Fundamentals



The Goals of Data Management

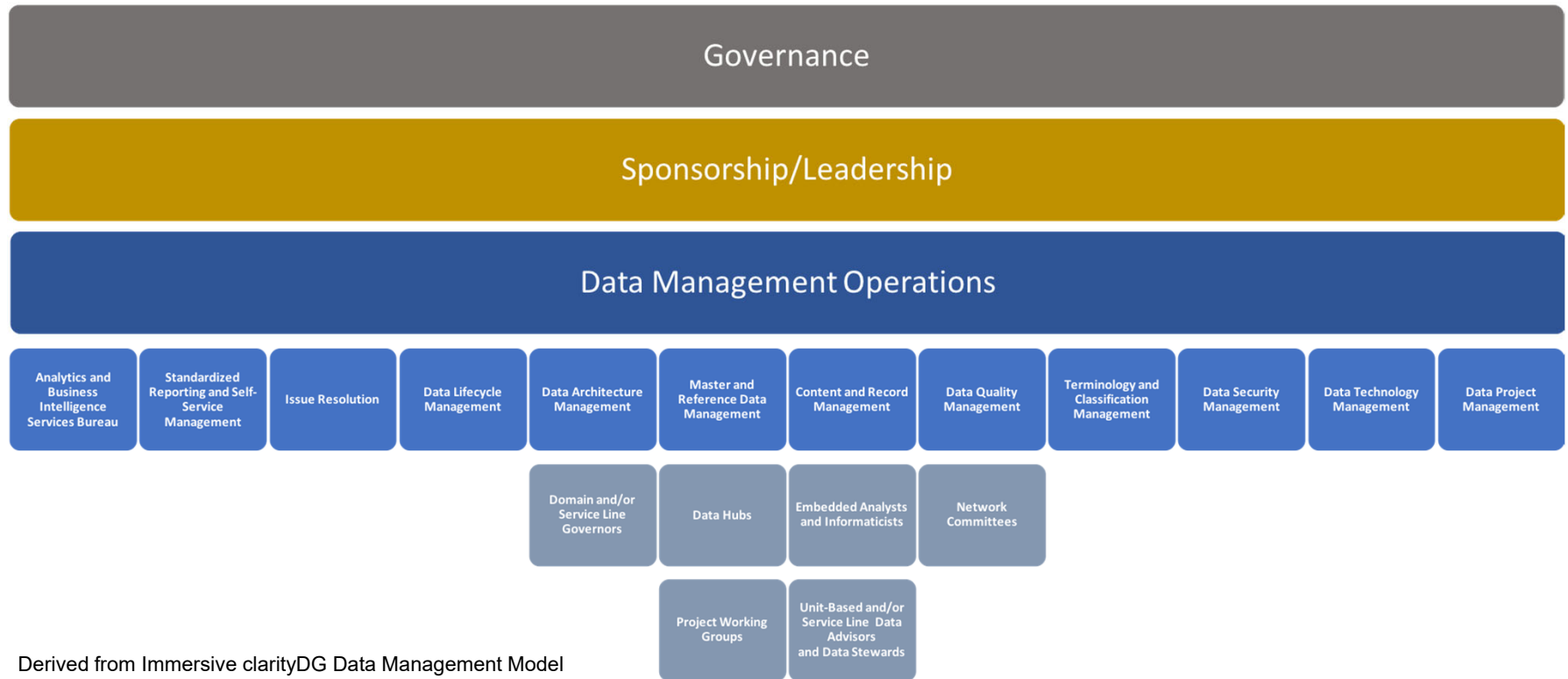




Data Governance

Most organizations implement some form of data governance in advance of, or in parallel with, more concerted data management activities.

Relationship Between DG and DM



Derived from Immersive clarityDG Data Management Model

Critical Data Management Functions

Function	Description
Enterprise Reporting and Self-Service Management	This function creates and maintains critical data/information “catalogs” of production reports and other data/information assets to support performance management/improvement and to foster self-service across the organization.
Analytics and Business Intelligence (ABI) Services Bureau	This function establishes a fulfillment process for net-new ABI support, reduces duplication of effort, ensures an effective use of resources, produces greater consistency, and increases the chances of a request being addressed correctly the “first time”.
Master and Reference Data Management	Master Data Management (MDM) is the discipline in which business and IT work together to ensure the uniformity, accuracy, stewardship, semantic consistency and accountability of the organization’s shared master data assets. This function establishes much needed discipline to improve data quality, usability, trustworthiness via the development of policies and procedures, and procurement of supporting tools/technologies to address the creation, maintenance, and use of Master Data.
Terminology and Classification Management	MDM starts with foundational and disciplined data/information terminology (e.g. dictionaries, business glossaries, etc.) and classification management. This function establishes and formalizes this expertise and supporting processes to create and/or adopt clear standards and shared understanding for the good of the organization.

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Critical Data Management Functions

Function	Description
Data Quality Management	Data quality management (DQM) is the process to discover data inconsistencies and take action on anomalies that are identified. This function establishes the program, priorities, measures, and processes to achieve data quality targets that ensure trustworthiness and fitness of data for its intended purpose.
Data and Information Lifecycle Management	Information life cycle management (ILM) is an approach to data/information asset management that recognizes that the value of data and information changes over time and that it must be managed accordingly. This function seeks to classify data/information according to their business value and establish policies and processes to ensure proper disposition of those assets.
Content and Records Management	This function further formalizes and elevates what many organizations already have in place based on data and information management standards.
Data Architecture Management	This function designs, builds, and maintains an organization's data blueprints – data models, databases and table structures, key data flows and integrations - that ensure a ready and responsive data environment.

Critical Data Management Functions

Function	Description
Data Technology Management	This function maintains the systems, platforms, tools, technologies and processes that enable enterprise data and information management.
Data Security Management	This function harmonizes data management directives and operations with existing information security, privacy and compliance program activities.
Data Project Management	Most projects in an organization today (and not just “IT” projects) have a data component. This function serves to establish data project management specialists that either serve a larger enterprise PMO or standalone to enable data awareness and extend data expertise into new projects.
Issue Resolution	This function, typically established in data governance, establishes clear policies, procedures and operational support for data-related issue management such as conflicting data definitions, data usage concerns, problems with how data is sourced, how it is integrated, how it is protected, or a myriad of other issues.

Data Management Functions

A Deeper Dive

Analytics & Business Intelligence	Standard Reporting & Self Service	Issue Resolution	Data Quality Mgmt	Terminology Classification Mgmt	Master & Reference Data Mgmt	Data Lifecycle Mgmt	Data Architecture	Content & Record Mgmt	Data Technology Mgmt	Data Security	Data Project Mgmt
BI Reporting & Visualization	Static Reporting	Data Issue Intake & Triage	DQ Assessments & Data Profiling	Business Glossaries	Master & Reference Data Mgmt	Retention & Disposition Compliance Auditing	Data Modeling & Simulation	Digital Asset Mgmt	Logical Data Warehouse Platform Mgmt	Access Mgmt	Data Readiness Evaluation
Analytics & Discovery Self-Service	Self Service Reporting Mgmt	Data Help Desk	DQ Measurement, Monitoring & Benchmarks	Data Dictionaries & Metadata Mgmt	Linkage & Relationships	Legacy Data Archiving	Data Warehouse & Database Administration	Content Discovery & Audit	Data Acquisition & Delivery	Compliance	Project Management
KPI & Metrics Mgmt	Data Extraction		Normalization Cleansing & Enrichment	Data Classification	Data Integrity & Stewardship	Content Management	Big Data	Content Classification	Data Analytics Platform Mgmt	Privacy	Planning, Forecasting & Performance
ETL			Discovery & Search	Vocabulary Standards	Data Matching	Backup & Availability Mgmt	API Management	Knowledge Base Mgmt	Data Preparation Tools	Data Classification	Activity Coordination
Data Normalization & Enrichment			Lineage & Provenance	Vocabulary Mapping	Data Enrichment	Application & Device Integration & Data Flow	Data Virtualization		Data Quality Tools	Security Controls	Resource Mgmt
Adv. Analytics (Embedded, Stream, NLP, etc.)			Linkage & Relationships	Taxonomies	Duplication Mgmt	Usage Monitoring	Data Science		Content Mgmt (MDM, Content Mgmt, etc.)		

Change Mgmt

Policies

Procedures

Standards

Oversight

clarityDG™

Operationalizing Data Management To Maximize Gains



Data Classification



What it is

Data classification is the process of organizing data into categories to enhance its use and management



Taking Action

Establish a data classification schema – start simple (e.g. restricted, private, public) and grow complexity over time

Create supporting policies

Systematically implement with departments



Its impact

Data Protection

Regulatory/Legal Response

Information Lifecycle Management

Effective and Efficient Data Use

Data Standards Adoption



What it is

Data standards define the rules by which data are described and recorded – format and meaning

Other standards that support data standards include content, terminology and privacy/security



Taking Action

Look to Standards Development Organizations like the Office of the National Coordinator's Interoperability Standards Advisory (ISA) for standards specifications and implementation guidance (www.healthit.gov/isa)

Collaborate with partners



Its impact

Information Sharing and Interoperability

Patient Safety

Analytics

Data Quality



What it is

The ability of data to serve an intended purpose



Taking Action

Develop definitions and attributes of key concepts, data, and metrics

Implement a Data Asset Catalog/Metadata Repository/Report Catalog

Integrate basic stewardship into system implementations



Its impact

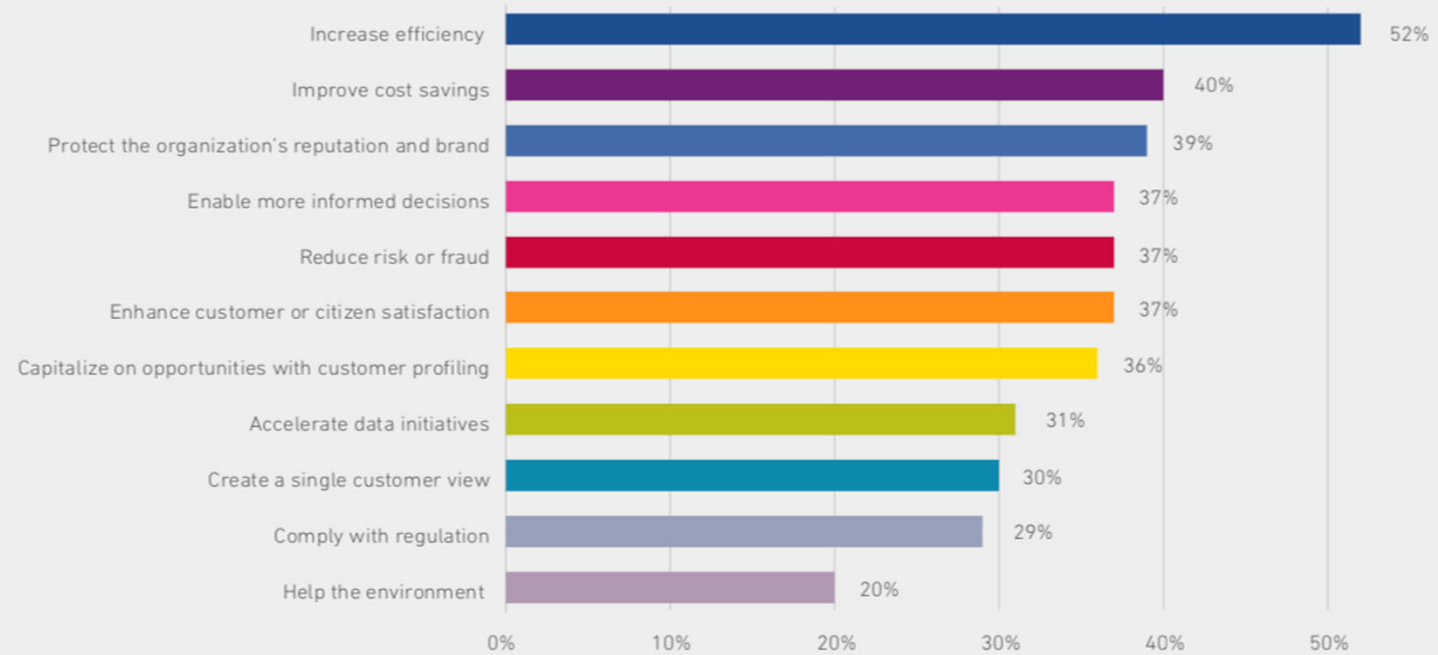
Provide clarity, comprehension, and trust of data

Accelerate use of data management, analytics, and interoperability activities

Enable self-service

What The Surveys Say

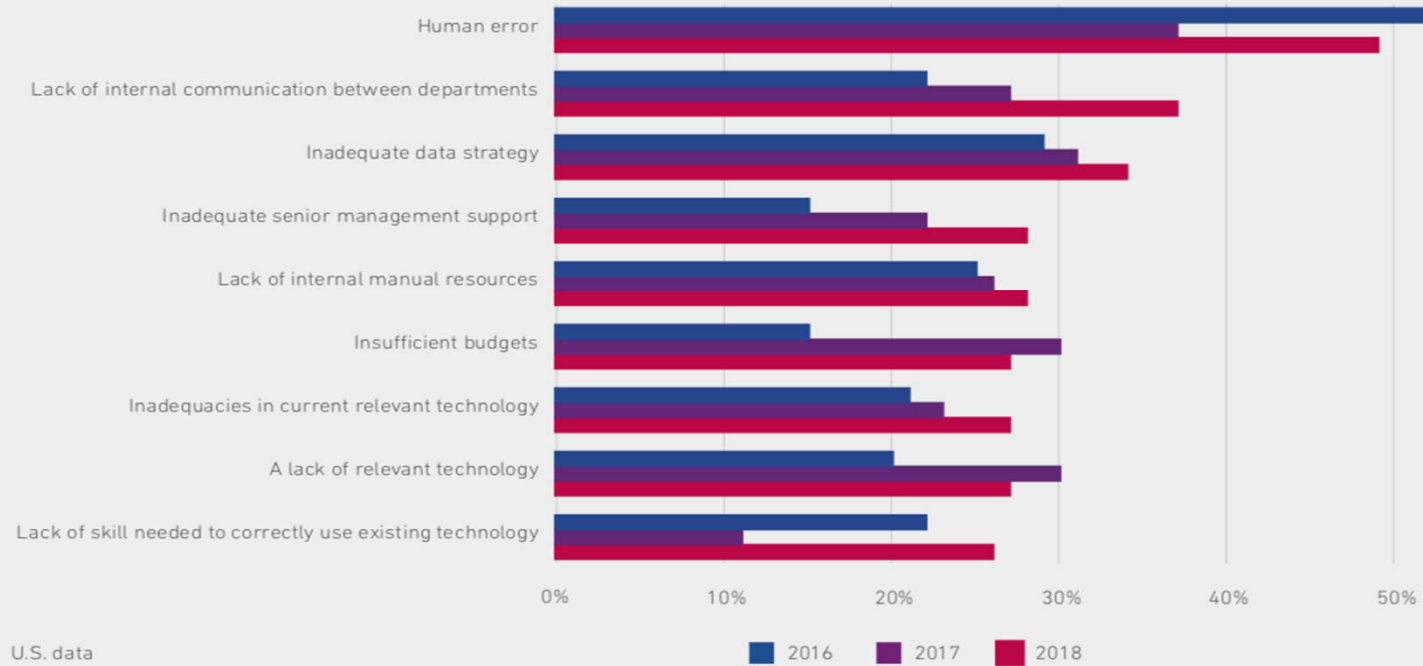
Chart 6
Strategic drivers for maintaining high-quality data



U.S. data, 2018

What The Surveys Say

Chart 8
Top factors contributing to data inaccuracies



Data Ownership



What it is

Assigned responsibility for definitions, policy, and practice decisions (administrative control) over a data domain or data set, no matter who collects or manages the data



Taking Action

Implement data stewardship program...or not

Align data ownership with master data management - which business owners best understand how data is created, used, etc.

Start with a domain or data set



Its impact

Data Protection – Access and Appropriate Use

Lifecycle Management – Disposition

Change Control

Data Quality

Data Integration



What it is

Data integration is the combination of technical and business processes used to combine data from disparate sources into meaningful and valuable information



Taking Action

Architect and manage ETL, EAI, EDI, Medical Device Integration, Streaming Data, ESB, and Data Virtualization holistically

Eliminate redundant technologies – standardize



Its impact

Reduced complexity and cost

Improved visibility

Better performance

Accelerated results

Improved data quality

Data Preparation



What it is

The cleansing, standardization deduplication, and other transformations performed on data so that they can be used in analytics



Taking Action

- Prioritize data sets
- Implement shared metadata, persistent managed storage and reusable transformation/cleansing logic
- Explore AI and ML technologies



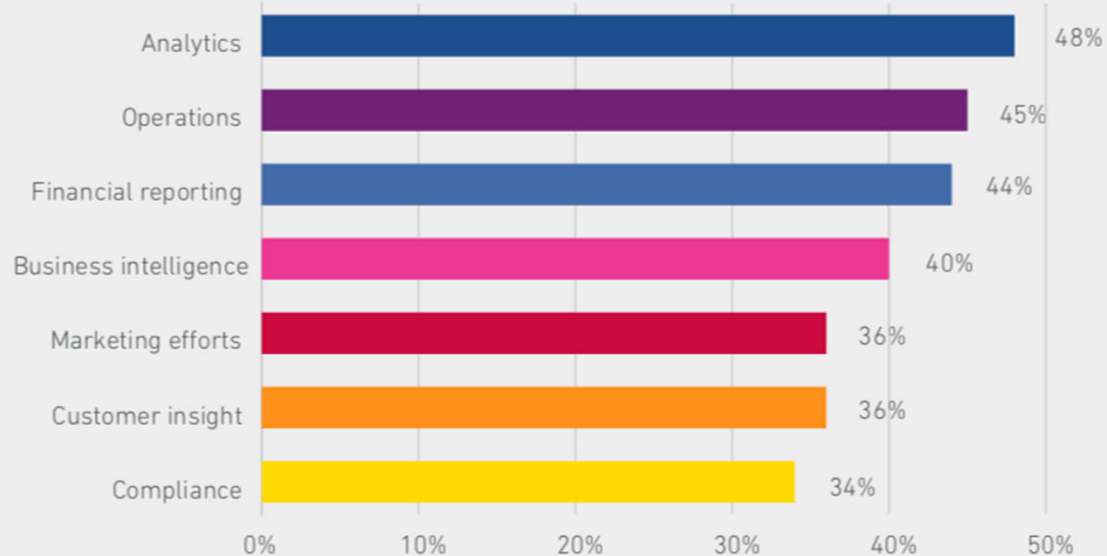
Its impact

- Data Usability and Trustworthiness
- Can be costly if manual – up to 44% of analyst time relate to data preparation
- Accelerator for AI and ML to improve efficiency

What The Surveys Say

“Data is rarely in an appropriate condition to be used for analytics when it is extracted from a source repository.”

Chart 13
Strategic initiatives requiring data preparation or wrangling



U.S. data, 2018

Data Enrichment



What it is

The process of augmenting enterprise data with third-party data to yield new opportunities for more meaningful analytics



Taking Action

Identify use cases

Inventory the DaaS landscape...HIEs, registries, DaaS providers...who has what you want/need and procure it

Anticipate the role that third-party data sources will play in the organization's data ecosystem



Its impact

Data Quality - particularly master data sets (e.g. provider data, patient identity)

Population Health and Personalized Medicine Initiatives

Data Ethics



What it is

The moral responsibility related to data collection and use by persons and artificial intelligence.



Taking Action

Identify principals and values of the organization (mission, risk, compliance, common sense, social acceptance)

Develop strategy, policy, and education and evaluate

Evaluation of current practices



Its impact

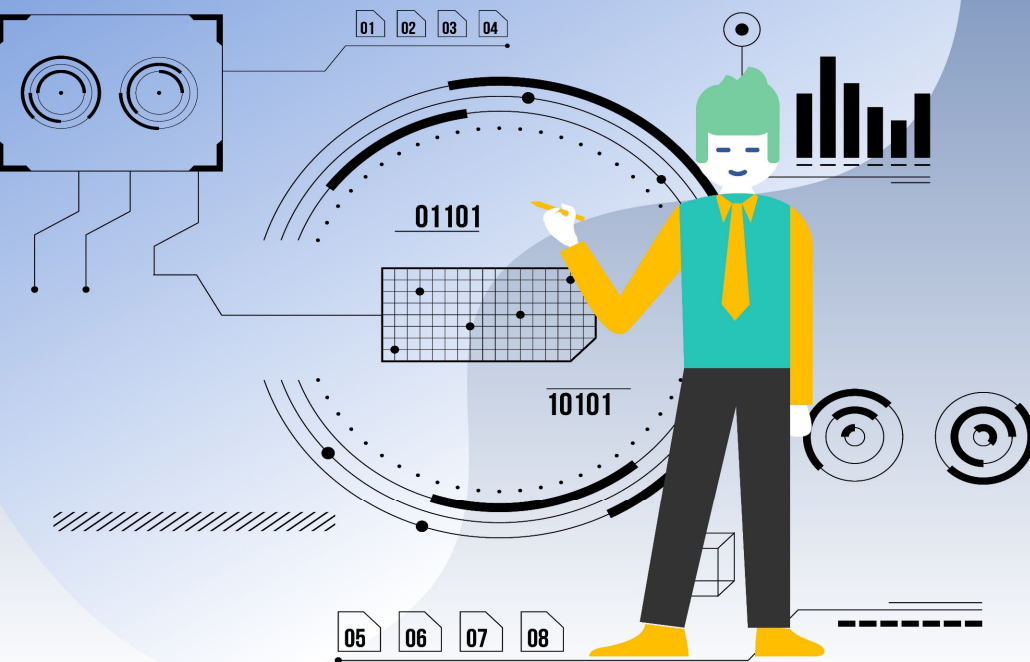
Transparency

Protection of individual and group rights

Risk reduction

Personalized medicine

FINAL THOUGHTS!



- Enterprise data and information management functions should be formalized and operationalized to achieve greatest benefits
- Data management functions can and should be activated in alignment with strategic and tactical business needs
- Even if critical data management functions are not formalized and operationalized, value-creating activities can and should be pursued
- Consider people + process + technology considerations