



Data governance: Driving value in healthcare

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WATCHFUL, WATER,
CARE, WELLNESS,

TRANSITION, STATISTICS,
STRATEGY, STRENGTH, STRENUOUS,
STRIKE, STRONG,
STABILITY, SUPINATION,
SUPPORT, SURGERY,
HEALTH, HEALTHY, SWIMMING,
HYGIENE, HYGIENIC,
EXALT, EXERCISE,
FIT, FITNESS, FLEX,
FUNCTION, HEALTHY
HYGIENS, HYGIENIC YARDS,
VAULT, VEGETABLES,
VITAL, VITAMINS,



HEALTH

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The first step in the healthcare analytics journey

Health care systems and providers have become increasingly focused on the need to use evidence to inform clinical and operational decisions. This has led to them assembling and critically evaluating ever larger data sets around care delivery, performance, and cost. As health systems continue to adopt technologies to enable new or improved approaches to diagnosis and treatment, the size of our data sets will continue to grow.

The vast amount of data generated and collected by a multitude of stakeholders in healthcare comes in so many different forms — insurance claims, physician notes, medical records, medical images, pharmaceutical R&D, conversations about health in social media, and information from wearables and other monitoring devices. Data is growing faster than ever before and by the year 2020, about 1.7 megabytes of new information will be created every second for every human being on the planet (Forbes, 2015).

It is the scale of this data that sits at the very heart of the fourth industrial revolution and the impact it will ultimately have on the way we care for patients and communities in the future.

As healthcare environments become increasingly dependent on digital technologies to support care delivery (at a user, organizational and healthcare system level), their ability to use and exchange data becomes a critical enabler of transformation. In healthcare systems around the world, data and analytics (D&A) is re-shaping the way leaders make evidence-based decisions to improve patient outcomes and operational performance. However, despite the proliferation of data, most organizations find it hard to optimize data assets to deliver sophisticated and practical

insights.

Tactical impacts and strategic value

When healthcare organizations implement new technologies to support business and clinical transformation, they typically focus on two levels of impact: the immediate tactical benefit of the technology on workflow and related key performance metrics; and the strategic benefit from taking newly available data and integrating it with and enriching existing data sets to create new value. Most tend to focus on the first set of benefits and neglect the substantial opportunities presented by the latter.

For healthcare organizations to truly realize the potential of data's analytical power, they have to shift their approach to address both these levels of change. This document focuses almost exclusively on a frequently missed strategic opportunity that holds the greatest promise for transforming integrated care networks/systems: data governance.

The foundation of your strategy

Data governance defines how an organization manages its data assets, and, in a digital world, how improved decision-making should be operationalized. This calls for an appropriate authority model to manage data functions. Many healthcare leaders understand the importance of data governance, but struggle to:

- Understand where their data lives and how to access it
- Put in place effective processes to protect data from threats of inappropriate release and access; and
- Acquire and develop the right resources and skillsets to manage healthcare data.

To access the very latest thinking on the subject, we have gathered the experience of KPMG's leading global D&A professionals and interviewed healthcare CEOs and CIOs to better understand their concerns and ambitions. Our framework for designing and implementing data governance aims to demystify the topic and helps to overcome common challenges and pitfalls, by outlining practical steps to effectively manage enterprise data assets.

First, we define data governance and its key elements. Appreciating the importance of data stewardship, ownership, policies, and standards lays the groundwork for sustainable governance. We highlight some of the typical data governance 'traps' that healthcare organizations fall into when beginning their D&A journey.

Next, we outline KPMG's approach to structuring and implementing data governance, including roles and responsibilities, key data management capabilities, and critical success factors. Woven throughout, we provide case studies from our healthcare clients across the globe, sharing vital lessons learned.

Finally, we explore other important considerations, such as protecting information privacy (in the regulatory context), data sharing (both internally and externally), and enabling technologies for data management.

The first step in your data and analytics journey

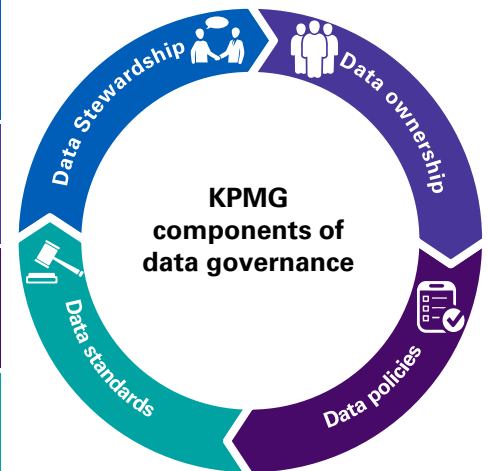
In KPMG's 2017 publication *A blueprint for success in healthcare data and analytics*, we urged organizations and systems leaders to establish a D&A strategy. Harnessing the power of D&A in healthcare is a journey, and data governance is the first, critical step.

What is data governance in healthcare?

Data is now one of the most valuable assets in any organization, especially as healthcare transitions into a more digitally-driven industry. Demystifying data governance, and articulating its importance in realizing value for patients and carers, is a key pillar of any D&A strategy. But where to start? KPMG has developed a practical approach based on four main components.

Data governance has four components supported by enabling data management services and data quality tools.

1	<p>Data Stewardship is the accountability for the management of data assets. Data Stewards do not own the data, but instead are the caretakers of the enterprise data assets, ensuring the quality, accuracy and security of the data.</p>
2	<p>Data ownership is the responsibility for the creation of the data and the enforcement of enterprise business rules. It constrains or defines data use in the organization.</p>
3	<p>Data policies are the rules that an enterprise utilizes to manage its data assets, including enforcing authentication and access rights to data and compliance with laws and regulations.</p>
4	<p>Data standards are the precise criteria, specifications and rules for the definition, creation, storage and usage of data within an organization.</p>



The term 'data governance' emerged to describe how organizations manage and influence the collection and utilization of data. It specifies decision rights and accountability, and encourages desirable behaviors towards how data is valued, created, stored, used, archived and deleted. But how does this definition fit, when so many healthcare systems are now integrating care? New care models aim to not only improve individual organizations' operations and performance, but to also enhance system-wide sustainability and improve patient outcomes. While the concept may sound complex and opaque, healthcare leaders and executives need to appreciate the value of a robust data governance strategy for organizations and wider health systems.

Strong data governance ensures that the right information, of the right quality, is available to the right person, for the right purpose, at the right time.

Evan Rawstron, KPMG Global Healthcare D&A Lead

How data governance can help healthcare organizations and systems:

Define, approve and communicate data strategies, policies, standards, architecture, procedures, and metrics – this is vital in new emerging models of care where 'trust' is a key element of working collaboratively



Provide a single system of record for data that needs to be consistent across multiple platforms (e.g., customer, product, location) – supports standardization in reporting and data protection measures

Enable conformance to data policies, standards, architecture and procedures – have a shared taxonomy and ensure compliance



Create accountability and connectivity of roles, vertically and horizontally – enhancing organizational/system decision-making

Use a consistent framework to help organizations sponsor, track and oversee the delivery of data management projects and services in an increasingly complex environment



Promote understanding of the value of data assets – maintain momentum in a data-driven digital economy

Manage and resolve data related issues – assure users that the data they use is accurate



Facilitate increasingly important digital conversations between patients and health professionals about care in the face of new regulation

Key client challenges

We asked clients from New Zealand, Australia, United Kingdom, United States and Canada to reflect on their data governance journey. We heard many common themes, and learned that leaders still worry about what data to share, and when and how to govern the sharing process. Let's look at the short-, medium- and long-term challenges facing executives:

1

Short term: Getting started

1. Awareness from the start

- **Before starting, recognize that data governance will mean different things to different individuals.** People in the organization may not understand the term 'data governance' or may see it merely as a control mechanism – when in fact it is for their benefit. Understand the underlying culture and focus on bringing people along this journey through active attention to messaging
- **Business priorities should drive data governance.** Though a data governance journey might initially be motivated by IT initiatives such as enterprise data warehouses, enhancing analytics capabilities, or merging data source systems, it should ultimately be driven by business priorities
- **Start your journey with the areas of greatest need.** Identify key organizational drivers and start with areas of greatest need, remembering that 'perfection' is difficult to achieve. Consider how to get results from data processes without overthinking the journey ahead

Don't come at it as "they shall do it". Be very specific on identifying the value, and understand the culture and environment. Focus on things that you can fix

Kash Patel, Vice President, Population Health & Analytics, Mt. Sinai Health System (US)

The reality is we don't have the resources or time to wait for a big bang approach. Part of our role is to prove that we can collaborate around data in incremental but meaningful ways using 'quick wins' or 'use cases' to prove to the system data collaboration can work and establish momentum to stand up a data sharing programme.

Neil Crump, CDO of Worcestershire Office of Data (UK)

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2. Tactical

- **Identify quick wins and create a manageable data governance council.** Show progress early and often, as interest rises when people feel their data issues can be fixed. Show senior leaders their data risks through use cases, and let them talk to each other by establishing a data governance council. Ensure that the highest levels of the organization are represented and take ownership.
- **Find the 'sweet spot'. Be at the appropriate level.** Figure out the value data brings to the organization, and do what is needed to realize that value. The cost of getting to the most advanced level of data governance may not make financial sense for every organization.

3. Focused

- **Be mindful of legislative requirements and enhanced data processes and reporting needs.** In many countries, governments require standardized data reporting or data protection measures, and/or offer incentive-based funding opportunities. Take advantage of data assets, and be on the right side of data protection and data legislation.

Clients are becoming more mature in their expectations of an organization in the quality of data they want to receive

Christopher Joyce, Vice President, IT Enterprise Data Solutions, Anthem Inc. (US)

Medium term: Changing the culture

4

4. Strategic

- **Align IT governance and data governance.** This can speed up deployment of an electronic health record. Embedding data governance considerations during the system design stages can reduce risks at later stages of the data governance journey.

We see now that managers are managing data on a daily basis instead of making decisions based on gut reactions

Lynsey Milner McNeal, Director, Data Governance, Saint Luke's Health System (US)

Long term: Viewing data as an asset

5. Pervasive

- **Shifting the culture towards data governance takes time.** Help senior leaders to talk about data as an asset and encourage a culture of change. The hardest part can be pacing the learning and not rushing the discovery phase. Executives should recognize the importance of data governance to maintain momentum towards a data-driven digital economy.

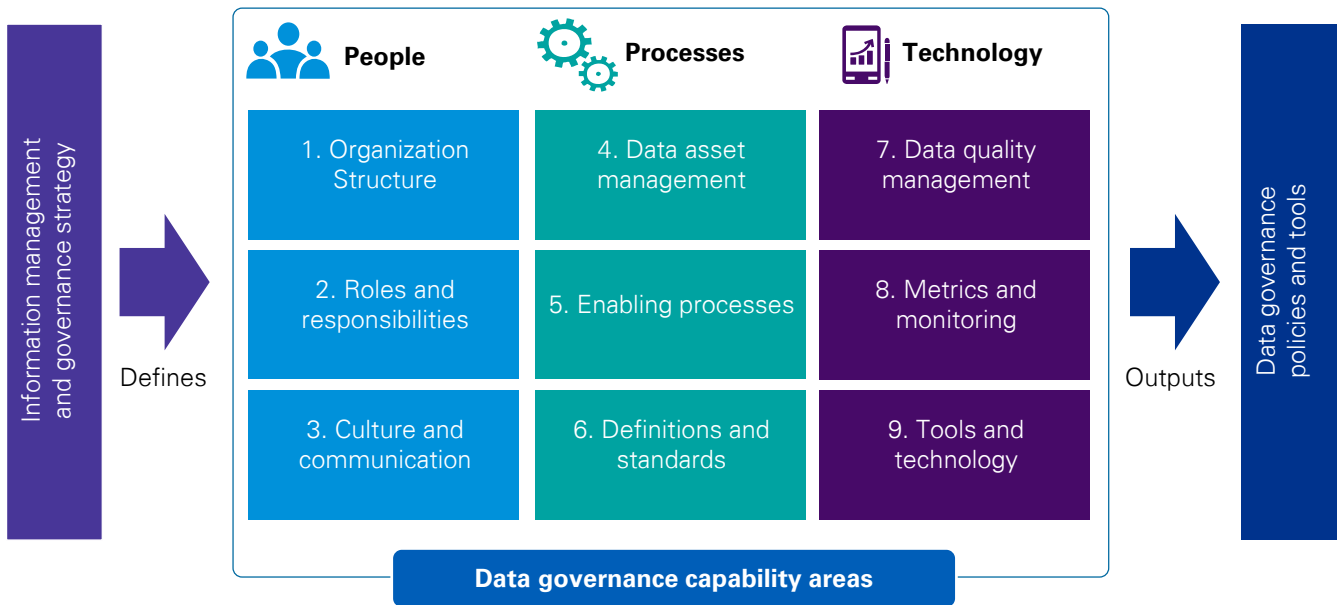
We are at the foothills of a massive cultural shift. If we rush it we miss the opportunity to learn as an organization and properly position data as an enterprise asset

Michael Caesar, Executive Director, Data & Implementation Science, University Health Network (Canada)

Competencies and capabilities

Healthcare executives should be aware that technology alone will not create an effective data governance function. To truly enable, embed and continuously improve on the key components of data governance, organizations should adopt a capability framework that incorporates people, processes and technology.

The following framework identifies the essential data governance capabilities in these three areas, to achieve a holistic data governance function.



Definitions of data governance capability areas

- 01 **Organization:** Establish a data governance team structure, which includes C-level presence and support, assuring its mandate to create, manage and publish data governance processes, including development and oversight of policies, standards, taxonomies and data sources
- 02 **Roles and responsibilities:** Identify subject matter experts to support enterprise and operational initiatives, by outlining clear responsibilities for data stewards, data owners and data consumers, including clarity on decision rights, approval processes and ownership of quality improvement programs
- 03 **Culture and communication:** Establish transparent governance processes that provide structure for data stewards and other personnel to create organizational norms, through a functional community of practice, easily accessible documentation, and robust internal customer service function
- 04 **Data asset management:** Prepare a data asset maintenance plan to articulate how to manage exponential growth in data volumes and complexity, including developing a data asset catalog, which explains data quality expectations, metadata definitions, source system environments, and dataset archives
- 05 **Enabling processes:** Embed data governance processes into project pipelines, resource allocation, and budget management within the organization to clarify how new data assets, multi-level access to management, and response times for data requests will be managed and maintained
- 06 **Definition and standards:** Establish collaborative processes to support the ongoing management and oversight of data dictionaries, taxonomies and business rules, as well as appropriate usage guidelines for data sources – using industry standards where possible
- 07 **Data quality management:** Ensure adequate data governance representation on Change Advisory Boards, to inform changes in source systems that may result in corrupt or inconsistent data. Use documentation to inform others, including measuring data quality and executing corrective actions
- 08 **Metrics and monitoring:** Automate data quality monitoring and detection capabilities, by aligning with statistically-driven detection methods and implementing standardized reporting and real-time dashboards, which help measure data quality and improve real-time clinical decision support systems
- 09 **Tools and technology:** Develop robust data governance policies, to help develop data architecture and cloud-based technologies, and to enable accessible feedback systems to record breaches and improvement opportunities.

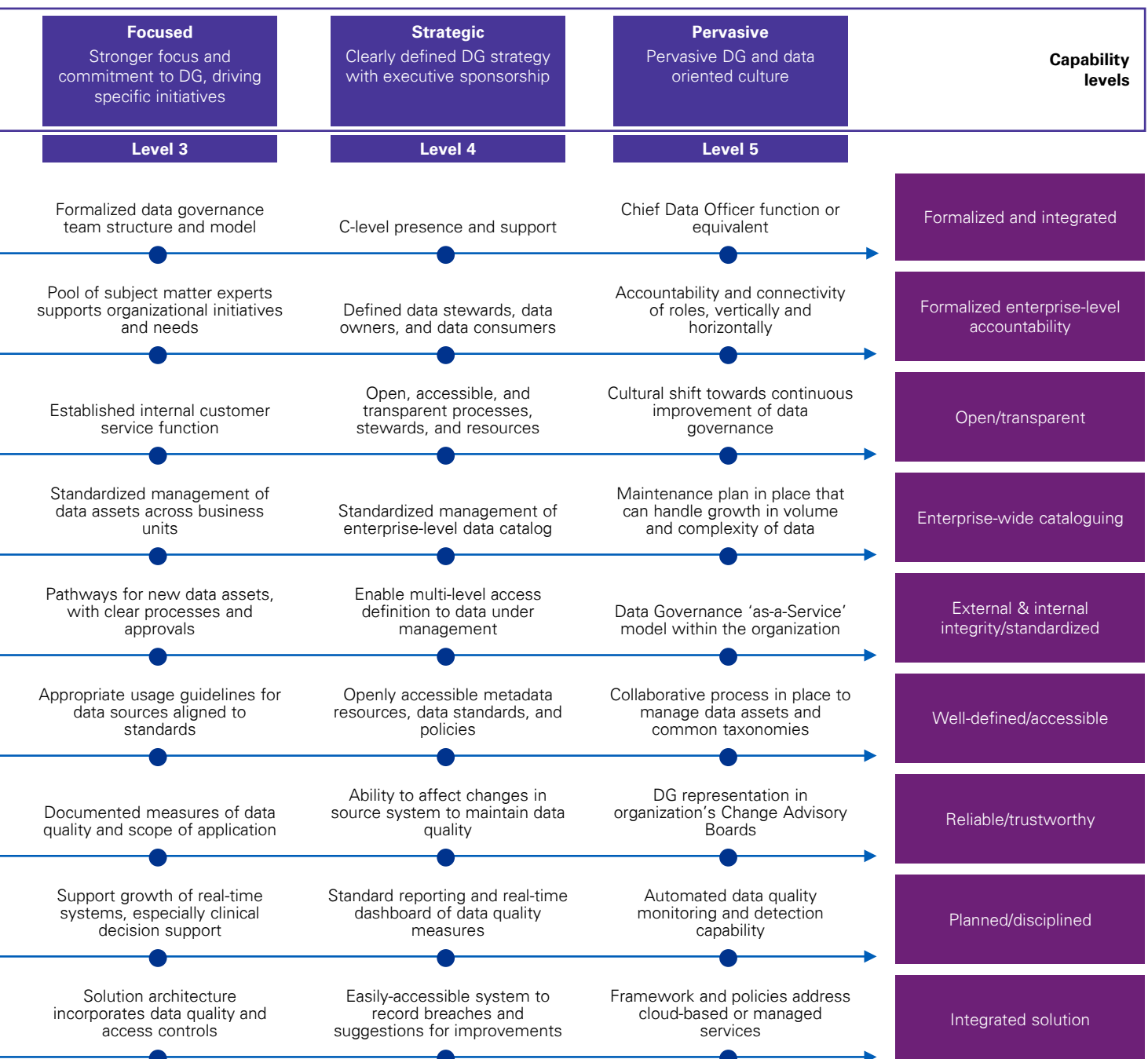
Maturity model

Organizations should understand the current state of their data governance functions before they can envision their future shape. Building on data governance capabilities, the following maturity model is a useful tool for achieving this goal and can be applied at both organizational and business area level.

Using this model makes it easier for leadership teams to plan the roadmap to across nine key capability areas:

- Defining the 'current state' can uncover critical success factors and gather lessons learnt
- Once this is complete, leaders can identify the work required for each capability area, clarify priorities and responsibilities, and develop a program of work to develop a 'target state'
- The maturity model can also be used for monitoring, by periodically assessing progress and realized benefits.

Capability areas	Maturity Levels	
	Aware DG vision, investment, and commitment yet to be identified	Tactical Some siloed DG initiatives; no true sponsor
	Level 1	Level 2
Organization structure	Informal	Awareness of the purpose and importance of data governance
Roles and responsibilities	Uncoordinated/independent	Limited to separate, internal business units
Culture & communication	Closed/opaque	DG resources not clearly defined at the organizational level
Data asset management	Uncatalogued/disorganized	Siloes of data governance responsibilities
Enabling processes	External integrity/non-standardized	Individual responsibility to maintain commitment to DG vision
Definitions & standards	Variable/poorly-understood	Disconnected communities of practice across business units
Data quality management	Unreliable/imprecise	Poor understanding of data assets and their ownership
Metrics & monitoring	Impromptu/as-needed	Unclear/poorly-managed informal processes
Tools & technology	Siloed/disparate tools	Defined response times to data requests
		Inconsistent adherence to industry standards
		Incentivized adoption of industry standards where possible
		No rigorous or reliable processes in place for maintaining data quality
		Business units assume individual responsibility for data quality
		Inconsistent identification of quality metrics within or across business units
		Monitoring of key metrics at the business unit level
		Disparate tools used across units, with no consideration for DG implications
		Individual units assess new toolsets in context of benefit to DG improvement



Other considerations

A data governance strategy should reflect an organization's strategic goals, risk appetite, culture, and economic and regulatory environment. Data and analytics (D&A) is a dynamic area and healthcare organizations and systems need to be agile to respond to constant change. Here are some of the factors to consider in order to get the most out of data:

Main considerations for:



Legislation and risk

- Existing and emerging regulation and policies are likely to have a huge impact on data governance, affecting patients' data privacy rights, professionals delivering care and healthcare organizations.
- Safeguarding and protection: everyone has the right to protection of personal data, and processing of such data must be 'fair' – only carried out for specified purposes and with the consent of the person concerned. People should also have the right to access personal data and have incorrect information rectified.



Data sharing, security and cybersecurity

- Focus on tactical and strategic data sharing, and demonstrate the benefits. Quick wins can enable larger strategic investments to harness the power of your data.
- 'Stitch' data together: ensure someone has responsibility to join up the systems data
- Be collectively clear on the desired benefits of sharing data and ensure controls are in place to share only relevant data.
- Healthcare experiences twice the number of Cyber Attacks as other Industries. Cyber Security assessments provide an in-depth review of an organization's ability to protect its information assets and its preparedness against cyber attack.



Cloud

- Any move to the cloud should not negate or weaken existing data governance principles that protect patient and staff privacy, information security and data integrity.
- Not all cloud providers are the same, and not all offerings have the same service level agreements. When moving to a cloud based provider, organizations should assess the provider's maturity, capability, and existing accreditation in the local market.
- Cloud based clinical software offers multiple accessibility options. To make the most of this exciting technology, re-assess existing use cases and future scenarios to ensure controls are in place and auditability is preserved.
- Ensure an open channel of communication with providers. Ensure there's visibility over any future activities that may result in the flow of data offshore.

Key things to think about ...

- What legal issues should you consider?
- What are the rights of the individual?
- What will the future look like?
- What opportunities do they offer to engage patients in new ways?
- What are the rights of the individual? How will the sometimes conflicting rights to privacy and health be brokered?

- Does your program have senior-level support, budget, and resources to drive change?
- How will you determine and measure the outcomes and benefits from improved data governance?
- Have you outlined the information sharing path? Have you jointly worked to understand regulation, to generate trust?
- How do you develop right balance of information protection and accessibility
- Who in your organisation is responsible for ensuring data security?
- Does your D&A strategy include protocol in the event of a cyber attack?

- Are you concerned about moving clinical applications into the cloud? How can you gain greater clarity on how to achieve such a shift?
- Have you ever stress tested your existing controls by simulating data breach scenarios? Does your Cloud provider have processes in place to mitigate such events?
- What are your obligations if data is held offshore?

By showing how the data drives value, we can further enhance our analytics capabilities ... to help providers and partners be better at what they are doing.

Anthem-US

The voice of the patient or resident is becoming increasingly important in the data governance agenda. As digital grows and regulation attempts to keep pace, using and managing consent creates both challenges and opportunities for health systems

**Stephen Dobson, CDO
of Greater Manchester
Health and Social Care
Partnership**

Case studies



Alberta Health and Alberta Health Services, Canada: Data governance for health systems management

Alberta Health (a Department of the Government of Alberta) and Alberta Health Services (Alberta's single regional health authority) have evolved a joint information and data governance structure to better enable health systems management in the province.

- Alberta Health (AH) is accountable for setting the policy and direction to lead, achieve and sustain a responsive, integrated and accountable health system.
- Alberta Health Services (AHS) is the largest provincial, fully-integrated health system in Canada, responsible for delivering health services across multiple domains to over 4.3 million people.

Their shared vision is to ensure Albertans receive the right health services, in the right place, at the right time, by the right health providers and teams, with the right health information. Both organizations produce valuable data that, collectively, provide insight into the health status of Alberta's population; the efficacy of health promotion and illness prevention strategies; the effectiveness of practice guidelines and clinical pathways; optimized models of team-based care; and the cost of the system in relation to health outcomes. Integrated data and information management is a core capability for both entities, enabling the development of sophisticated business intelligence and analytics programs.

AH and AHS are represented on the Provincial Health Information and Data Governance Committee which provides advice on health information policy requirements for the primary and

secondary use of data. This committee, along with its sub-committees, provides the forum for data stewards and owners to set information policies and standards for the Alberta health system; address risks and opportunities around the exchange of health data in the provision of care; and guides the use of health data for health system management, quality improvement, evaluation, and research.

The Data Governance Committee interfaces with the joint Provincial Health Information Executive Committee (HIEC) where AH and AHS work collaboratively with representatives from professional colleges and associations and the public, to oversee the development and implementation of information management and technology strategies and initiatives. Joint initiatives have included the creation of secure technical capabilities to share data sets (reducing duplication and increasing quality), and the implementation of data de-identification technology to anonymize and pseudonymize data sets for secondary use. Building on the existing joint governance structure, AH and AHS are creating a number of new 'pillars' to drive data governance and improve analytics, including 'Consumer' and 'Provider' pillars. The former will be focused on engaging Albertans in their own health care through generation and use of their own health data; while the latter will focus on driving appropriate information sharing and advanced analytics across multi-disciplinary provider teams. The ultimate goal is to create a set of effective, balanced rules that enables 'analysts' from front-line professionals to health system administrators to generate actionable insights, and create a continuous evidence-base for improved patient care and health systems management.



Greater Manchester Combined Authority (GMCA), UK: enabling data sharing partnerships

As health systems embrace integrated care and new care models involving numerous stakeholders, data sharing is set to rise significantly. Facing a £7 billion (US\$10 billion) funding gap, Greater Manchester Combined Authority (GMCA) – which covers five percent of the UK’s population – received the country’s first city-level devolution of powers and funding from central government. GMCA quickly identified the need for change, both in the way information is shared and how it is used to facilitate service integration.

A major part of the program involved designing a new whole system information and data governance model, to increase collaboration, problem-solving, and pace for proportional information sharing across 37 major health and social care partners.

KPMG’s team designed a data governance strategy, to give GMCA leadership a better understanding of its maturity level and capabilities. We also helped the client manage the technical and cultural challenges of setting up what was the first sharing body of its kind in the UK. Our core principle was that data should be shared unless there is a legal, statutory or privacy policy reason not to do so, whilst allowing residents the right to opt out. And, to help the various partners gain greater insight and value from their data, we also developed a new, balanced, end-to-end operating model.



Large eastern US University Medical System: standardization & data governance validation

As this large academic medical center was about to embark on the replacement of its EMR system with EPIC, it realized that transformational improvement in healthcare could not happen with a software implementation alone. What changes EPIC might bring would not be sustainable without data governance. They sought to understand where the opportunities were within the enterprise to standardize and apply data governance principles.

KPMG conducted an assessment of the medical center’s Care Delivery Process and compared it to leading practices to validate and show impacts of standardization and data governance on their clinical and business processes. Opportunities by process were identified and a future state framework and timeline was delivered. This included a high level conceptual data governance model that describes organization and process recommendations within a timeline that blended with their upcoming EPIC rollout. KPMG tools were available to help accelerate the design of a governance framework. The tools enabled more effective decision making, early identification of program risks, and a streamlined, standardized program for implementation that provides clear accountability.



Large state agency for Health Care Finance and Administration; data governance assessment, US

This client manages multiple system with large amounts of sensitive data (including HIPAA protected PHI/PII and IRS Safeguard data). From eligibility to claims system, their data is subject to many requirements and standards from federal and state agencies (e.g. CMS, IRS, etc.) which, if violated could result in lawsuits and penalties which could severely hamper the ability for it to operate. It recognized the need to establish a centralized structure with supporting processes to govern, protect, and maintain its data assets. They sought a real-world experience in data governance assessment, design, and implementation to assist in developing an actionable and practical data governance roadmap. They selected KPMG.

KPMG identified what components of data governance were in place, the current gaps from leading practices, and opportunities in the near term and long term to bridge the gaps identified. Several key initiatives were described in detail providing overview and value to the client; from a governance council and defining the role of a CDO, to development of a master data strategy, metadata strategy, and critical data element identification. A roadmap with three levels of intensity over a three year period was provided for the client to choose from as their way forward.

Summing up

What does data governance mean to healthcare organizations and systems? And why is it so crucial to master data governance to help improve performance? As a key pillar of D&A strategy, data governance defines how an organization manages its data assets – yet many leaders still don't fully appreciate its value and are unclear where they should be investing. To summarize, this document discusses three key themes:



Data governance is a foundational element of digital transformation, in that it defines how an organization manages its data assets. Without a rigorous, sustainable data governance program, healthcare organizations and systems will struggle to advance their analytics capabilities into key areas such as artificial intelligence and machine learning, personalized healthcare and population health management.



In this document, we have discussed the core data governance capabilities required, and outlined a data governance maturity model. Together, these provide the frameworks and initial key steps that can enable healthcare organizations and systems to begin building capacity, as a foundation for advanced analytics.



There are many strategic considerations that will shape healthcare organizations' approach to data governance. National or jurisdictional privacy legislation, data sharing practices and certain technologies can enable and challenge healthcare leaders charged with managing data assets. Moreover, these issues are evolving rapidly and are likely to test the limits of analytics leader's ability to adapt.

How can KPMG help?

KPMG's data and analytics and healthcare professionals understand the complexities of implementing and sustaining effective data governance, as part of a strong, advanced D&A program. We have helped clients around the globe, at all stages of data governance maturity. If you require expertise on your transformational journey, please contact us.

In our work with healthcare providers, payors, and regulators in 45 countries around the world, we regularly hear from leaders that while they recognise the latent power of data, they are struggling to unlock its full potential. As leaders work to use information to develop and execute upon strategy, they increasingly report that often examination of their growing and increasingly complex data sets generates greater uncertainty.

The purpose of this paper has been to help demystify the role of data governance in helping healthcare organisations and systems use data to achieve its full potential. It is an essential tool for any organisation seeking to make better use of its data assets today and will be a critical enabler of those organizations that have an aspiration to remain or become a leading healthcare provider tomorrow.



Contact

To discuss this piece in more detail, feel free to contact the authors.



Lydia Lee

Partner, MC - IT Advisory KPMG in Canada

T: +1 416 777 8874

E: lydialee1@kpmg.ca



Eric Applewhite

Director, Risk Consulting
KPMG UK

T: +44 (0)7796 937808

E: Eric.Applewhite@KPMG.co.uk



Evan Rawstron

Global Healthcare D&A Lead KPMG Australia

T: +61 0 409 554 989

E: erawstron@kpmg.com.au



Karina Guy

Partner, MC - IT Advisory KPMG in Canada

T: +1 587 990 3636

E: karinaguy@kpmg.ca



Paul Henderson

Healthcare D&A Lead KPMG in the UK

T: +44 (0)7900 053439

E: paul.henderson@kpmg.co.uk



Jeff Bailey

Director, Healthcare Data & Analytics, PMP
KPMG US

T: +1 (615) 248-5697

E: jeffbailey@kpmg.com



Christopher Foster-McBride

Global Executive for Healthcare D&A

T: +44 (0) 7552260911

E: chris.foster-mcbride@kpmg.co.uk

kpmg.com/uk



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