

Modern Enterprise Data Management in Healthcare

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A Technical paper on implementing generic infrastructure for Healthcare which is Data Governance compliant

Technology is advancing, data volume is growing, and cybercrimes are increasing - every other day. There are proven data and information governance methods and frameworks in existence, but today, the question persists : are they capable enough to promise a fast-advancing but stable, secure and efficient framework for Data Management in an organization?

This article is an attempt to find how organizations can benefit from a dynamically progressing governance model, which can be easily and, automatically improved in pace with the latest advancements in Healthcare technologies, by making use of the modern information technology tools & techniques.

Data Governance is about defining: process, protocol, policies, rules, goals and KPIs across the business/organization. The policies guide how to collect, move, update, deliver, and maintain data. In a nutshell, it is about 'the efficient use of data, thereby promising high ROI'. On the other hand, there is *Data Management*, which is about the implementation as per the defined Data Governance assets. It is a *program*, which begins before the project starts, and will continue to run even after the project ends. There exists initiatives such as [DAMA DMBOK](#) to guide businesses for setting up and running Data Governance and Management initiatives in the organization but those guides discuss in a generic level so it may not solve specific problems directly because of two reasons -

1. Though foundation is similar, design of data governance strategy will be different from industry to industry,
- 2) Its Big Data era.

Need for Data Governance in Healthcare

Today, data is the magician's stick to give answers to complex problems. The depth of [four V's of Big Data](#) - Volume, Velocity, Variety and Veracity of the data is increasing exponentially and today's enterprises recognize the tremendous opportunities this is giving to improve

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businesses by maximum utilization of data. But as per a [recent study by Harvard Business Review](#), even though Data Analytics and Artificial Intelligence are the prime area of investment by business leaders, they are struggling to maximize ROI. Most enterprises are yet to succeed in reaching maturity while more than half of them say they face various difficulties in data management in terms of knowledge, technology and tools.

When the data properties change too fast, technological solutions are also advancing in parallel to accommodate the momentum. But as a result, we now have a wide range of technologies and platforms to choose from, and we literally ended up in dilemma because the healthcare enterprises do not get convinced easily on which provider is matured enough to support them, and are skeptical because they understand *“There is no one-size-fits-all”*.

Types of Data in Healthcare



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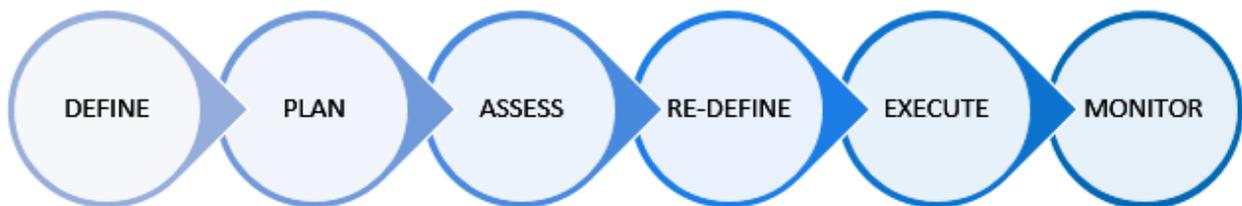
Note: *This is a generic list of data types, and does not cover most*

Depending on the area(s) of focus by each healthcare organization, there will be different types of data to be gathered, stored, analysed and evaluated in order to achieve a targeted ROI.

EMR / EHR	Administrative Data and Operational Data
Clinical Research/Trials Data	Claims Data, such as Insurance
Patient devices data (Wearable / IoT)	Medical Equipment Data (MRI Scanner)
Pharmacy Data	Distributed/Shared Data (eg. donor banks, research)
Open Data Sets	Finance Data
Human Resources	Laboratory Data

Setting up Data Governance

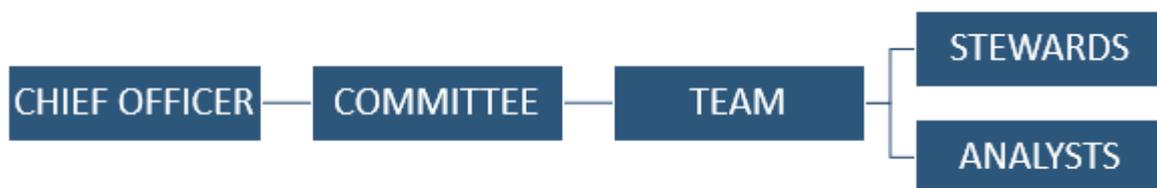
Process starts with planning of the program and, doing an assessment and gap analysis to find out where do the organization currently standing in terms of governance and data management. Up on finishing the analysis, we will re-plan the program from the findings, to reuse any existing processes and policies and make sure we do not rework on any already operational ones. Then the implementation phase, which is usually the bigger phase where actual enforcement of plan happens. Monitoring and regular audits will be conducted to make sure the system is following the governance plans and meets organizational goals, and also to make corrective actions as well as accommodating new changes.



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Committee Formation

The program is organized and coordinated by people. On top of the pyramid, there will be a person responsible for the overall governance of the program, and we can call him/her: Chief Information Officer, or Chief Data Officer, or something similar. He leads a committee, which usually consists of directors, executives or key decision makers in the organization and this is the council who reviews, defines and publishes the process guidelines, policies etc. Then there are data stewards and quality analysts who could be the business data handlers. Team structure might vary from business to business. Usually new or specialized hiring will not be required because the current employees, as part of the job can easily handle the positions because people working in healthcare domain knows the healthcare data better.



Use and Sensitivity of Data

All, or most of the data flowing in healthcare are of sensitive in nature. It is the responsibility of each healthcare organization to secure and protect the information from misuse, either unintentionally or intentionally. In addition to the ethical grounds, [most countries established one or more healthcare Acts, or regulations](#) to protect the health information of their fellow citizens. Below is some adherence requirement in USA:

- HIPAA: The Health Insurance Portability and Accountability Act, 1996
- PSQIA: Patient Safety and Quality Improvement Act, 2005
- HCQIA: Healthcare Quality Improvement Act, 1986
- MACRA: The Medicare Access & CHIP Reauthorization Act, 2015, etc.

Data Governance and Management

Data Governance is about implementing, enforcing and maintaining a set of rule, or policies which clearly guides people and processes in the company on collection of data, secure storage

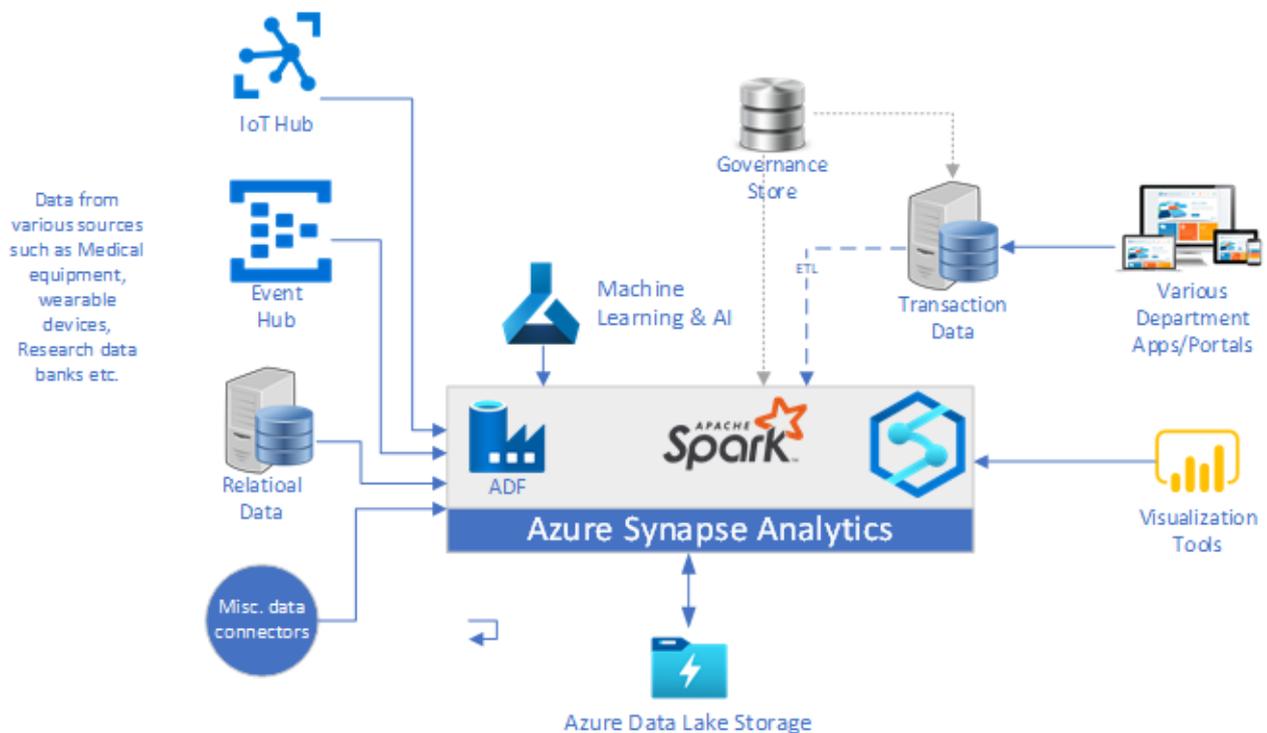
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of data, use of data, monitor the process, and disposal of data. [Data Governance is the heart of Data Management](#). Data Management can be defined as the process of *technical implementation* of Data Governance.

Data Management using Modern Data Warehouse Platforms

Technology is not a barrier for implementing a Data Management platform for healthcare.

Here is a technical solution based on [Azure Cloud platform](#), which has adherence to generic Data Governance policies.



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References

1. DAMA-DMBOK2 and CDMP - <http://dama-phoenix.org/wp-content/uploads/2015/09/DAMA-Phoenix-DMBOK2.pdf>
2. Azure Synapse Analytics - <https://azure.microsoft.com/en-in/services/synapse-analytics/>

About the Data Science Foundation

The Data Science Foundation is a professional body representing the interests of the Data Science Industry. Its membership consists of suppliers who offer a range of big data analytical and technical services and companies and individuals with an interest in the commercial advantages that can be gained from big data. The organisation aims to raise the profile of this developing industry, to educate people about the benefits of knowledge based decision making and to encourage firms to start using big data techniques.

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