

Lessons Learned on Data Governance "Journey"

September 22, 2022 Dan McCarthy

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- Hydrogeologist/Environmental Consultant for 25 years
- 30+ years working with environment data management systems
- Implemented data governance programs for environmental, asset liability and product stewardship management systems
- Member of ITRC's Environmental Data Management Best Practices Team

Agenda

• Overview

- What is data governance?
- What are the elements of a data governance program?
- What is data governance for EQuIS?
- How can EarthSoft help?
- Lessons Learned Examples
- EQuIS Data Governance

EQuIS Data Governance – What Is It?

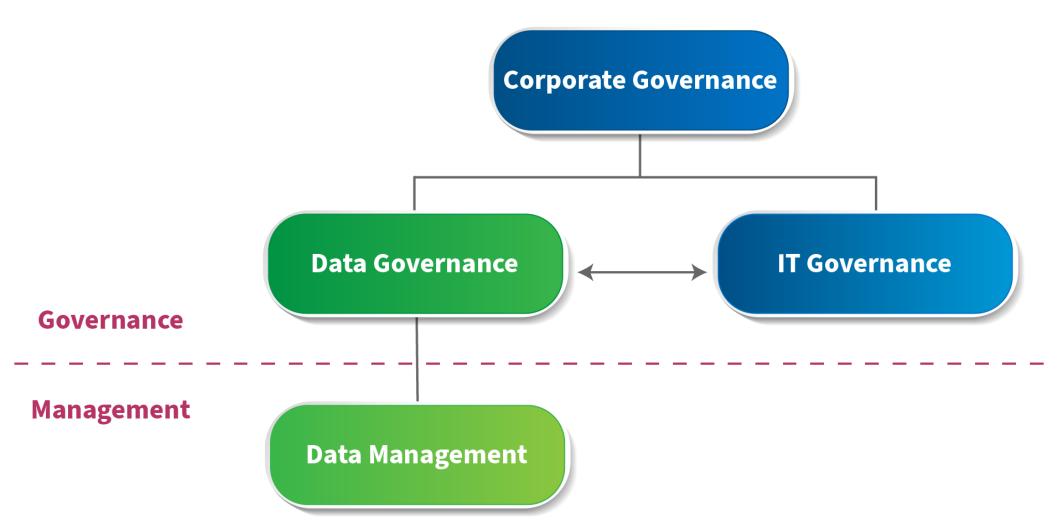
Planning, monitoring, and enforcement for EQuIS Implementations. EQuIS data assets must be protected and managed.

Data Governance Ensuring that Data Are Managed Data, Information, and Content Lifecycles

Data Management Managing Data to Achieve Goals

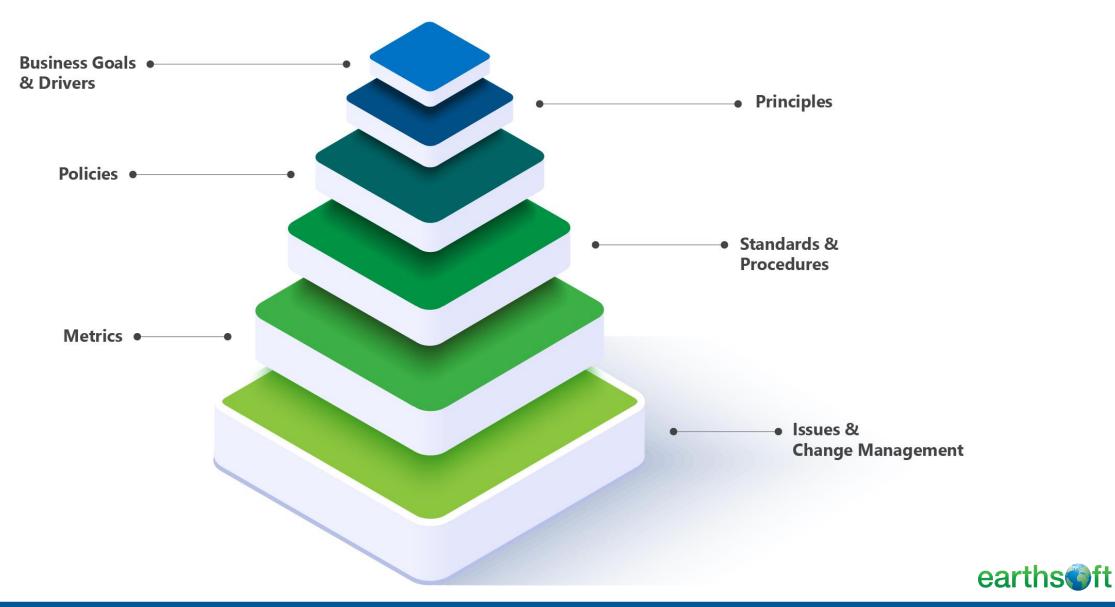


Governance Programs





Elements of Data Governance Program



Data Governance Business Drivers

- Growth / Business Agility Arrive at decisions and recommendations faster with increased efficiency and accuracy.
- Lower Cost / Operational Efficiency Streamline workflows and automate data-related business processes.
- Risk Management / Compliance and Security Define data standards, policies, and processes with clear roles and responsibilities to ensure compliance internal and external policies and regulations.
- Improve Quality Ensure data are accurate, complete, timely, consistent with all requirements and business rules, and relevant for a given use.
- **Sustainability** of the investment.

EarthSoft Business Drivers for EQuIS Data Governance

- Growth / Business Agility EarthSoft wants to help our EQuIS end users grow their operations with increased efficiency and accuracy.
- Lower Cost / Operational Efficiency EarthSoft seeks to streamline EQUIS workflows and automate EQUIS data-related business processes.
- Risk Management / Compliance and Security Want successful EQuIS implementations to reduce risks and ensure compliance with internal and external policies and regulations.

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- Improve Quality Quality is in our name and a key value-add of our software...Quality data, quality implementations, quality reports...
- Sustainability of our clients' EQuIS investment.

Lesson 1: Regulated Utility



Challenges

- Multiple business units
- Inconsistent approach to valid values
- Existing field processes were optimized for data collection, but had significant office labor post field event to roll up to management
- Laboratory Program in place created resistance to change

Solutions



- Committee to align valid values
- Engage with field personnel early
- Demonstrate time and cost savings to Lab Program

Lesson Learned: A team is stronger than an individual champion

Lesson 2: Government Research Facility

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Challenges

- Lots of legacy data, with ownership of that data
- Highly structured EDMS in place, but was bespoke and few understood the schema
- Data Quality program had unique vocabulary
- Significant number of nuanced laboratory contracts
- Programs had nuanced sampling requirements

Solutions



- Document valid values with meaningful descriptions
- Provide a path for the bespoke experts for the future
- Plan for course-correction during EDMS implementation

Lesson Learned: Change will happen. Leave no one behind. Plain language.

Lesson 3: Oil and Gas (Among Others)

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Challenges

- Implementation went OK
- Systems were monitored by a single individual
- Individual left, governance languished, and program ground to a halt

Solutions



- Design governance plans with fault tolerance
- Make data providers own the quality of their deliverables
- Socialize location of governance documents

Lesson Learned: Governance is bigger than one person



Lesson 4: Mining Company

Challenges

- No centralized platform for management or analytics
- Lack of consistency in data standards (collection methods, QA/QC, validation)
- Existing systems did not integrate well
- Majority of operations and surveillance performed remotely by third parties
- Lack of efficiency in sample collection/time burned on sample planning
- "We are very good at having standard processes and procedures for H + S but fall short on the E"

Solutions



- ✓ Keep solutions simple
- Invite everyone to the party (avoid myopia)
- ✓ Start develop governance approach early
- ✓ Find the right tool to visualize metrics

Lesson Learned: See the big picture (transactional vs. data as asset)



Lessons Learned Summary

- A team is stronger than any individual champion. Governance is bigger than one person or department.
- ✓ Leave no one (department) behind
- ✓ Standards are needed
- ✓ Change Management
- ✓ Use plain language
- See the big picture (transactional vs. data as asset)
- ✓ Select the right Metrics



EQuIS Data Governance Documents

- Covers some of same topics as ITRC, but specific to EQuIS nomenclature and products
- Suggested Master Data and Reference Data
 - Sample Planning Module
 - Data Qualification Module
- Establish Format Specifications
- Guidelines for Generating High Quality Data
- Business Intelligence / Metrics
- Historical Data Migration Best Practices and Tools



EarthSoft works with organizations to establish EQuIS Data Governance programs based upon their business goals and drivers and data principles. This checklist provides an overview of data governance elements that are important for maximizing investments in their EQuIS data management system.

Organizational Framework

Define roles and responsibilities relating to data governance and data management

Gather contact information for all stakeholders (e.g., organizational contacts, subject matter experts, laboratory contacts, field data collectors, data users, regulatory agency contacts, contractor contacts and EarthSoft contacts).

Create Data Policies

Data Acquisition – Ensures data uploaded to EQuIS are fit for use. Defines use of EQuIS Collect or EDGE. Data Integrity - Ensures data in motion between the EQuIS ecosystem and other systems are transferred in a secure way from known authenticated sources that can be audited.

- Data Security Addresses EQuIS Facility and User permissions, use of EQUIS REST API, and data exports. Determines who will host and provide IT support for EQuIS database.
- Data Quality Ensures high-quality data, which are accurate, complete, consistent, reasonable, timely, and valid. Describes use of EDP, SPM, and DQM
- Data Use and Sharing Ensures data are not misused or abused, and are used ethically, according to any applicable law, and with due consideration for individual privacy.

Data Management Workflow Review

Examine current data workflows and identify desired improvements. The workflows should maximize use of electronic exchanges of data between field and laboratory personnel (e.g., use of Collect Data Form, eQuote, eCOC, and eSRN). Includes:

Planning for data collection

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Why Perform D

Businesses that have en

equirements frequently

data management system

business drivers for organizations

efficiency and accuracy

automation of data-rel

and EDMS.

EDMS and data governance are as fo

Growth / Business Agility - Arriv

 Lower Cost / Operational Efficien business goals by streamlined w

Performing field data collection (manual and automated data logging)

Processing for laboratory data analysis and review

What is Data Governance?

Data Governance

and EDMS — The Short

Data Governance can be defined as the "exercise of authority and control (planning, monitoring, and enforcement) over the management of data assets." Data governance focuses more narrowly on the issues surrounding its access, protection, compliance, and usage of data with the goal of bringing maximum benefit to an organization

· Who can access which segments of data (and how to minimize unnecessary access and risk)?

· Determine who will manage enterprise data and establish a system of accountability for those roles.

 Develop policies to maintain compliance with local, state, federal, and other regulations.

 Identify and implement tools that can be leveraged to make the most of the data.

The overall goal of data governance is to enable an organization to manage and protect data as an asset in a sustainable way. Data governance is not data

management. Data governance functions to guide data management activities and ensure that data are properly managed.

The Governance of Data Managed in EQuIS[™]

Environmental Data Managment Software



EQuIS Data Governance

- Most data governance issues are data quality issues
- Releasing Second Edition of *The Governance of Data Managed in EQuIS*
- Phased Distribution



The Governance of Data Managed in EQuIS[™]





Preferred Laboratory Program

- Framework for analytical data workflows
- Standardize data governance workflows and processes
- > Establish protocols and documented best practices
- Standardize workflows for situations with multiple labs and consultants
- Lab and Field Team Scorecards
 - Compare Lab A with 1/100 failed EDDs to Lab B with 3/1,000 failed EDDs
 - Rank Reasons for Failing EDDs





EQuIS Analytical Data Workflow

ALS Sends eSRN (Sample Receipt Notification)

ALS imports the eCOC XML, assesses the samples received, and generates an eSRN EDD. The eSRN is a confirmation of the samples received, analysis requested, the scheduled reporting date, and any identified issues. Based on the eSRN, clients can schedule resampling activities with EQUIS SPM or take other needed actions.

EDGE/Collect Field Events

Schedule field events with SPM by assigning analytical requirements to sampling locations to create Field EDD Events.

ALS Sends eQuotes to EQuIS

eQuote XML contains analytical information defined by the client: A collection of MAGs/Methods/ Analytes/Units/Containers.

ALS Sends EQuIS EDDs

ALS sends analytical EDDs, zipped with a user certificate, to Enterprise EDP, ensuring data integrity. ALS reviews "rejection" notifications and ensures data are loaded successfully.

eCOCs with EDGE/Collect

After completing the field events, client sends eCOCs to ALS containing sample information and analysis requirements.

EQuIS Link Imports eQuotes

EQUIS Link imports the eQuote XML files using the eQuote Format automatically creating SPM Labs Contracts.



Standard Reference Values

EarthSoft and ALS have standard RefVals (Analytes/Methods) for new projects in Australia.

EQuIS SPM Completeness Reports

Completeness Reports are generated tracking a project's field and lab data based on the sampling and analysis plan

