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# Improving Sustainability through Data Governance

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**ABSTRACT**

Sustainability in a business context is a company's role in society, how it generates value by managing positive and negative environmental and social impacts, and how its decisions impact a wide range of stakeholders. Regulatory agencies have recently disclosed guidelines for standards of Corporate Sustainability scorecards to include Environmental, Social, and Governance(ESG) metrics. Currently, organizations struggle to provide accurate, reliable ESG data which can pose a risk to the organization and potential future compliance issues. Understanding the correlation between data governance and ESG is essential for encouraging ethical and sustainable business practices. Using a Design Science Research Methodology (DSRM), this research will assess how environmental data fits into existing data governance frameworks and will identify modifications that need to be made by updating and creating new data capabilities of the IT Capability Maturity Framework – contributing to both academia and industry.

**Keywords**

Sustainability, ESG, Data Governance, Design Science Research, IT Capability Maturity Framework

**INTRODUCTION**

Sustainability and data governance are two key concepts that have become more and more connected in today's world. Sustainability in a business context is a company's role in society, how it generates value by managing positive and negative environmental and social impacts, and how its decisions impact a wide range of stakeholders. It involves balancing the present needs with the needs of the future while also considering how the current actions will impact future generations and the environment (Winston, 2023). Environmental, Social, and Governance (ESG) is a framework used by investors and business stakeholders to measure the sustainability of an organization. ESG is a term that encompasses non-financial elements that measure corporate behavior (Duran, 2023) which include metrics around the conservation of the natural world, consideration for people and relationships, and standards to running a company (Daniels, Spiekhout, Haase, September 30, 2021; CFA Institute, 2024).

**CONTEXT**

ESG has become central to enterprise strategy, with the expanding regulatory landscape for nonfinancial reporting gaining prominence driven by public pressure for social change and investor demand. Both the United States(US) and the European Union(EU) made significant steps to standardize climate-related, ESG disclosures which will increase the transparency and consistency of this data for investors. The EU approved the Corporate Sustainability Reporting Directive (CSRD) which will require companies to report on the impact of corporate activities on the environment and society and requires an audit of the reported information – to make Europe the first climate-neutral continent by 2050. The CSRD went into effect in January of 2023 (European Parliament, Council of the European Union, December 14, 2022). On March 6, 2024, the US Securities and Exchange Commission(SEC) adopted a ruling that requires public companies to make standardized disclosures about climate-related risks and opportunities which will go into effect for large companies at the end of 2025 (SEC, 2024). Both the EU and the US SEC have issued environmental disclosures as the first regulations in ESG. Environmentally sustainable development is at the forefront of stakeholders' minds as governments, businesses, and individuals attempt to achieve net-zero carbon goals to ensure a sustainable future for our planet.

Data Governance is the process of managing the availability usability, integrity, and security of the data used in an organization (Abraham, et al., 2019). The importance of data governance in sustainability stems from the fact that data is essential for tracking and measuring progress toward sustainability objectives. The necessity of better governance and reinforcement of international rules and regulations or oversight structures (Sarbanes Oxley, Basel II, Solvency II, IAS-IFRS, etc.) imposes on enterprises the need for greater transparency and better traceability of their data through internal and external audit processes. There is no "one size fits all" framework for employing data governance (Delacroix & Lawrence, 2019) and no agreed-upon definition for data governance (Abraham, et al., 2019). Heavily regulated markets need more structure in their data governance activities as highlighted by Marelli, Testa, and Van Hoyweghen (a "re-purposing" of big data governance approaches in health research is needed under the lens of GDPR (Marelli, et al., 2021).

Requirements for ESG data quality, quantity, governance, and analytics will increase over time (Mingay, 2021; Duran, 2023; Mohanta, 2023). Organizations are disclosing ESG metrics, yet it is time-consuming to pull ESG metrics together due to data source identification, architecture, governance, collection, accuracy, and quality issues with ESG data elements. This could potentially pose future risks and compliance issues.

## THE RESEARCH MOTIVATION

All the stakeholders in a company have a role to play and benefits to reap from the overall goals here, but will invariably turn towards their IT department in search of the answers (Bonnet, 2013). Studies highlight that future work should focus on developing a holistic framework for a data governance strategy that highlights the main pillars, processes, and attributes to design more specific data governance programs with environmental considerations such as government legislation and the Data Protection Act. Teams have to consider all environmental aspects when designing data governance functions which contribute to building strong data governance in the organization (Al-Ruithe, et al., 2019). The focus of this research is to identify best practices for managing data in support of environmental metrics and strategies for effectively managing environmental data in support of sustainable and responsible business practices (Benfeldt Nielsen, 2017).

## RESEARCH QUESTION(S)

The following research questions are identified to be addressed include:

- What existing data governance frameworks be extended to include environmental metrics - the 'E' in ESG?
- What data governance practices ensure environmental data is accurate, reliable, and accessible that respects ethical and privacy concerns?
- How do organizations extend data governance frameworks around financial data and business-critical data to expand to encompass environmental data?

Identifying frameworks and recognizing best practices for data governance in support of environmental metrics to foster moral and sustainable business practices is crucial, as is comprehending the relationship between data governance and ESG.

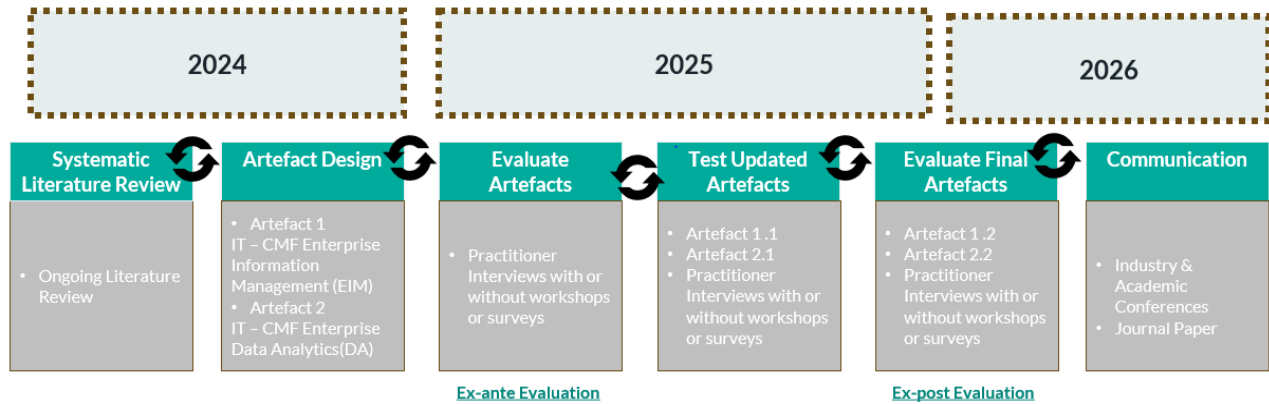
## RESEARCH METHODOLOGY

The Design Science Research Methodology (DSRM) will be used as it aims to develop innovative and practical solutions to "wicked" problems in a specific domain – the DSRM is well-suited for practitioner-based studies where the design of viable artifacts as output is represented by constructs, models, methods, and instantiations (Hevner & Chatterjee, 2010; Peffers, et al., 2007). "Wicked" is defined as (Hevner, et al., 2004):

- Unstable requirements and constraints based upon ill-defined environmental contexts.
- Complex interactions among subcomponents of the problem and its solution.
- Inherent flexibility to change design processes as well as design artifacts (i.e., malleable processes and artifacts)
- A critical dependence upon human cognitive abilities (e.g., teamwork) to produce effective solutions

Since looking at data governance models through the lens of ESG will require a deeper understanding of the relationships between the two, the DSR methodology is appropriate for this research due to the evolution of an artifact that will benefit academic and practical research.

Figure 1 shows the entire lifecycle of this research from the Literature Review to the ex-post Evaluation highlighting the iterative stages of the artifact design, and improving the artifacts at each stage.



**Figure 1. Evolution of Research Questions by Research Phases and Plan for Design Science Evaluation based on QM-DSR (Heneghan, 2022)**

**Literature Review**

A structured literature review (SLR), a systematic approach to review and summarize information, will require several iterations during the research cycle (Beecham, Hall, Robinson, & Sharp, 2006). In 2023, a literature review was conducted using academic libraries: SCOPUS, SAGE, and Web Of Science. For a broad understanding, the key terms data governance and “ESG” were used in separate searches. To understand the current literature encompassing both data governance and ESG, searches were conducted. Limited results were returned – See Figure 2. In Q1 of 2024, the same three searches were conducted which showed a growth in literature surrounding ESG & data governance indicating an increased appetite for research on these topics which can be seen in Figure 1. These findings identify a research opportunity for how data governance frameworks need to be adjusted for ESG metrics.

2024	Database		
KeyWords in Title, Abstract, or Key	Web of Science	SCOPUS	SAGE
ESG	8381	10360	1163
Data Governance	1316	2556	571
ESG & Data Governance	2	5	6
2023	Database		
KeyWords in Title, Abstract, or Key	Web of Science	SCOPUS	SAGE
ESG	6250	7658	897
Data Governance	1225	1779	407
ESG & Data Governance	2	1	3
Net New	Database		
KeyWords in Title, Abstract, or Key	Web of Science	SCOPUS	SAGE
ESG	2131	2702	266
Data Governance	91	777	164
ESG & Data Governance	0	4	3

**Figure 1. Academic Database Search**

There are over a thousand papers on data governance and thousands on ESG but there are few papers that show overlap in the academic literature on data governance and ESG. With the recent environmental regulations put into place, there is a demand for effective and efficient ESG data governance with environmental metrics to be addressed first.

### Artifacts

Researchers iteratively build and improve artifacts that solve the identified problem at each stage by combining their theoretical knowledge with their practical skills. A Capability Maturity Framework is a structured model used to assess and improve the maturity level of an organization's processes in a particular area (Carcary, 2011). This study will look at the IT Capability Maturity Framework (IT-CMF), a high-level framework for managing an organization's IT function which was developed by academics and practitioners using the DSRM approach allowing organizations to devise more robust strategies, make better-informed decisions, and deliver increased levels of agility, innovation, and value which was created in 2015 (Innovation Value Institute, n.d.; Curley, et al., 2017). IT-CMF is structured around four macro-capabilities, each of which embraces several Critical Capabilities(CC) that can contribute to agility, innovation, and value (Innovation Value Institute, n.d.). Thirty-seven CCs were assessed to understand if there was a tie to ESG or data governance. The following two CCs will be evaluated and updated as they directly impact data governance models - these CCs have not been revised since 2015 thus there will likely be updates.

- IT-CMF Enterprise Information Management(EIM)
- IT-CMF Data Analytics(DA)

Each CC is made up of several Capability Building Block Categories and Capability Building Blocks (CBB) as well as a Practice-Outcome-Metric(POM) template for stakeholders to assess the level of maturity in each of the CBBs and provide evaluation questions to assess their current state. This research will evaluate the following in each of the CCs, CBBs, and POM templates:

- What, if anything, has changed? What needs to be updated?
- What updates need to be made looking through the lens of ESG?

Evaluation of the CBBs and CC against the literature will take place to answer the above questions. Semi-structured interviews with eleven practitioners will start in 2025 – See Figure 2 above. These practitioners sit at various levels in the organization from Senior Executive level to Analyst with a mix of public, private, non-profit, and government organizations that vary in their annual revenue and industry to make for a varied list of participants.

The output of this research will be updated artifacts to the IT-CMF Enterprise Information Management and the Data Analytics Critical Capabilities to include 'E' factors in 'ESG'.

### NEXT STEPS

Before any data gathering can begin, an ethics approval process must be undertaken by submitting to the University of Limerick ethics board in Q3/Q4 of 2024. While the ethics application is underway the literature review is ongoing as well as creating evaluation criteria for the efficiency of the artifacts. In Q1 and Q2 of 2025, primary data collection in the form of interviews will take place as well as data analysis.

### EXPECTED CONTRIBUTIONS TO THE FIELD OF IS

ESG regulations that are designed to promote sustainable and responsible business practices will likely have a significant impact on companies, especially as the need arises to adjust their operations to comply with regulations. For example, companies may need to implement more environmentally friendly practices, such as reducing carbon emissions, using renewable energy sources, or reducing waste. Investors, clients, and other stakeholders are giving weight, and investment to businesses dedicated to ESG principles. As a result of the present and impending legislation, additional controls will be implemented around ESG processes and data disclosures, including the quality and governance of the data. The industry is looking for best practices and recommendations backed up with academic rigor. This research will assess how environmental data fits into existing data governance frameworks and will identify modifications that need to be made by updating the IT-CMF Enterprise Information Management and the IT-CMF Data Analytics CCs artifacts – contributing to both academia and industry.

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