

RESEARCH IN PROGRESS

THE DIGITAL PATH TO SUSTAINABILITY: A CONFIGURATIONAL INVESTIGATION

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Firms are increasingly leveraging information technology (IT) not only to enhance productivity, but also to improve their environmental performance. In parallel, organizations have begun creating IT-specific C-suite roles and assigning them responsibilities related to sustainability agendas. Against this backdrop, this preliminary study empirically explores whether and how different configurations of IT use for sustainability, IT-specific executive roles, and their environmental responsibilities may jointly shape a firm's environmental sustainability. We conduct a crisp-set Qualitative Comparative Analysis to uncover multiple pathways leading to high environmental sustainability. To deepen and validate our interpretation of these preliminary configurational findings, we plan to complement the analysis with text analysis of firms' reports. Taken together, our preliminary findings suggest that the IT–sustainability relationship is complex and configurational, offering an initial basis for future theory development and practitioner guidance on how digital resources and leadership structures may support environmental goals.

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1 Introduction

Environmental sustainability has emerged as a critical priority for firms worldwide, driven by increasing regulatory scrutiny, heightened stakeholder expectations, and the broader societal imperative to mitigate environmental degradation (Kocoglu & Mithani, 2025). Simultaneously, organizations are undergoing substantial digital transformation, investing in information technology (IT) to enhance operational efficiency, improve productivity, and enable data-driven decision-making (Wiener et al., 2025; Vial, 2019). These two developments, environmental sustainability imperatives and digital transformation trajectories, are increasingly intersecting. Firms are not only deploying IT to improve productivity but are also leveraging digital tools and data infrastructures to achieve environmental sustainability (Kotlarsky et al., 2023). In parallel, organizational structures surrounding IT leadership have evolved considerably. Many organizations have instituted IT-specific executive roles, including Chief Information Officers (CIOs), Chief Digital Officers (CDOs), and associated senior positions (Bendig et al., 2023). These leaders are increasingly entrusted with responsibilities related to environmental performance and sustainability governance, while also playing a growing role in digital innovation aligned with environmental objectives (Viets & von Delft, 2025; Zhang & Liu, 2025). Yet, despite these developments, existing literature offers limited insight into whether using IT for sustainability or elevating IT executives to sustainability-related decision-making roles contributes to improved environmental outcomes.

While research on digital sustainability highlights digital technology's role in supporting sustainable operations, such as analytics for environmental monitoring (e.g., Pan et al., 2021), it focuses on technology in isolation and overlooks the broader organizational context. Similarly, research on sustainability governance often neglects the influence of IT executives, despite the role of digital infrastructure in sustainability efforts. Thus, we lack a full understanding of how IT use and IT leadership jointly impact environmental outcomes.

To address this gap, our study examines the interplay between three critical elements: (1) a firm's use of IT for sustainability-related purposes, (2) the presence of IT-specific executive roles, and (3) the environmental responsibilities of IT-specific C-suite executives. We conceptualize environmental sustainability as the joint outcome of IT use for sustainability, IT-specific executive roles, and their

environmental responsibilities. Specifically, we address the following overarching research question: *What configurations of IT-for-sustainability, IT leadership, and IT governance drive high environmental performance?*

We posit that the relationship between IT and environmental sustainability is unlikely to be linear or uniform across firms. For example, investments in sustainability-oriented IT may be insufficient without proper leadership structures to guide, coordinate, and institutionalize their use. Conversely, appointing CIOs or CDOs with sustainability responsibilities may not produce significant results if firms lack the technological resources to implement meaningful environmental practices. Additionally, different combinations of conditions can lead to multiple viable paths for firms to achieve strong environmental performance.

To build the theoretical foundation for our configurational inquiry, we next review three streams of IS research that inform our understanding of how IT use, IT leadership, and IT governance jointly shape environmental sustainability outcomes.

2 Theoretical Background

Our study is at the intersection of three streams of information systems (IS) research: digital sustainability, IT leadership, and IT governance. While each stream offers important insights into how organizations can leverage IT to create value, they have largely developed in parallel, providing fragmented explanations of how IT contributes to environmental performance. Bringing these streams together allows for a more integrated understanding of not only what IT can achieve in the sustainability domain, but also who enables these outcomes and how they are orchestrated within organizations.

The first stream of research is digital sustainability (historically called “green IT/IS”). Prior work in this stream has shown, for instance, that green IT announcements generate positive shareholder reactions (e.g., Nishant et al., 2017) and that carefully designed persuasive digital systems can nudge employees toward pro-environmental behaviors even across work-home boundaries (e.g., Corbett et al., 2025). Yet, despite these important insights into IT's signaling value and behavioral influence, this stream of literature has not disentangled the specific pathways through which IT/IS contributes to environmental sustainability within organizations.

The second stream of research focuses on IT leadership, examining topics such as the critical success factors that enable effective IT leadership (e.g., Kaufeld et al., 2009) and the contribution of IT leadership roles to organizational performance (e.g., Hütter & Reidl, 2017). However, existing research tends to examine leadership effects in isolation, without considering how leadership interacts with broader organizational structures and governance mechanisms to influence sustainability outcomes.

The third area of research is IT governance, which examines how organizations extract value from IT investments while managing risks, how they align technology with strategy, and how they maintain accountability (Wilkin & Chenhall, 2020; Gregory et al., 2018). This area of research is concerned with the mechanisms through which organizations control IT, including oversight processes, decision-making structures, and the allocation of responsibilities for IT-related initiatives.

Taken together, these streams offer complementary but incomplete explanations: digital sustainability research emphasizes what IT can achieve, IT leadership identifies who drives these initiatives, and IT governance explains how they are structured and controlled. We argue that their relationship is best understood through causal complexity, where environmental performance arises from interdependent and intersectional rather than independent effects. Specifically, the impact of digital sustainability initiatives depends on the alignment between IT leadership and governance structures, which jointly enable and constrain their implementation. These relationships are configurational, such that multiple combinations of conditions can produce similar outcomes (equifinality), while misalignment may undermine them. Accordingly, we conceptualize environmental performance as the outcome of interacting organizational conditions, including the use of IT for environmental sustainability, the presence and positioning of C-suite IT leaders, their responsibility for sustainability, the presence of C-suite sustainability leaders, and exposure to ESG risk.

3 Method

Our sample for preliminary analysis consists of 40 certified B Corps drawn from across the globe. We selected B Corps because their certification provides external validation of firms' environmental performance, accountability, and transparency,

thereby reducing the likelihood that the sample would include firms primarily engaged in symbolic sustainability communication or greenwashing. This made B Corps an appropriate empirical setting for investigating organizations with a demonstrated commitment to generating genuine environmental impact.

Consistent with the approach used by Lou et al. (2025), we use the S&P Capital IQ Pro database and its integrated chatbot, chatIQ (late October version), which helps us retrieve information from various published reports through prompts, to capture whether the firm used IT for sustainability-related purposes, the presence of IT-specific executive roles, and the environmental responsibilities of IT-specific C-suite executives. In addition, we considered whether each company operates in sectors with high environmental risk exposure (e.g., energy, mining, etc.). Finally, we also considered, for each company, the environmental dimension of their ESG score, i.e., whether it was higher or lower than that of their peers. To ensure the reliability of results through prompts, we checked the outputs' sources and also regenerated the outputs multiple times.

To ensure data robustness, we triangulated our data with that obtained from Qinsights, an AI qualitative research GDPR-compliant platform, by analyzing annual and sustainability reports published between 2022 and 2025. We also checked the ESG score on the LSEG workspace to verify the consistency of the outcome variable. Regarding operationalization as a categorical variable, no issues were observed.

For our analysis, we use crisp-set Qualitative Comparative Analysis (csQCA) (Rihoux & Ragin, 2009; Nishant & Ravishankar, 2020). We operationalize all variables as categorical indicators, coding each as 0 when a firm does not exhibit the characteristic of interest and 1 when it does. While constructs such as IT use for sustainability and executive responsibilities are inherently nuanced, we adopt crisp-set calibration to focus on the presence or absence of key conditions, consistent with our configurational approach. This is appropriate given the difficulty of deriving reliable continuous measures from heterogeneous, text-based disclosures. We use the fsQCA 4.1 software and set a minimum frequency threshold of 1 case, and raw and PRI consistency thresholds of 0.80, for our preliminary analysis.

4 Preliminary Results

In our preliminary analysis, we identify three distinct causal pathways explaining high environmental performance, with IT-for-sustainability appearing as a core condition across most high-performance configurations. A C-suite IT leader responsible for sustainability emerges as a contributing condition in some configurations but accounts for very low unique coverage or explanation, suggesting limited relevance.

To deepen our interpretation of the configurational findings, we plan to supplement the above analysis with a qualitative text analysis of firms' disclosures, sustainability reports, and public statements, along with targeted interviews with the leadership of firms within each configuration. We expect this additional analysis to enable us to identify the underlying mechanisms that may explain why specific configurations yield superior environmental performance.

5 Potential Contributions and Limitations

This study offers three contributions. First, we advance green IT/IS research by showing that the IT–sustainability relationship is configurational: meaningful environmental outcomes arise from specific combinations of technological, structural, and governance conditions, not from IT adoption alone. Second, we contribute to IT governance and leadership research by demonstrating that CIO and CDO roles improve sustainability only when coupled with appropriate organizational conditions. Third, we offer practitioners actionable guidance by identifying multiple viable pathways to high environmental sustainability, recognizing that no single blueprint fits all firms.

Our study has several limitations. First, our sample of 40 B Corp-certified firms, while appropriate for csQCA, limits the generalizability of our findings to firms with demonstrated sustainability commitments. Second, our reliance on AI-assisted data extraction from publicly available documents may introduce measurement error, as the completeness and consistency of firm disclosures vary. Third, our binary coding of conditions, inherent to csQCA, may obscure meaningful variation within categories. Future research should replicate our configurational approach with larger, more diverse samples and explore finer-grained measures of IT use and leadership responsibilities.

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