

Corporate Digital Responsibility

Sustaining and Enhancing Legitimacy in the Digital Era

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List of Abbreviations and Statistical Symbols

Abbreviations

AI	Artificial Intelligence
ATT	App Tracking Transparency
CDR	Corporate Digital Responsibility
CSR	Corporate Social Responsibility
DAX	Deutscher Aktienindex (German Stock Index)
ESG	Environmental, Social, and Governance
EU	European Union
GDPR	General Data Protection Regulation
IT	Information Technology
JEL	Journal of Economic Literature
Max.	Maximum
Min.	Minimum
OB	Opportunity-based
OLS	Ordinary Least Squares
RB	Risk-based
SD	Standard Deviation
VHB	Verband der Hochschullehrerinnen und Hochschullehrer für Betriebswirtschaft e.V. (German Academic Association for Business Research)
VIF	Variance Inflation Factor

Statistical Symbols

M	Mean
N	Number of observations
p	p-value (significance level)
r	Correlation coefficient
R^2	Coefficient of determination
t	t-value
β	Beta coefficient (regression weight)

A Corporate Digital Responsibility: Research Framework

1 Introduction: Corporate Responsibility in the Digital Age

The digital transformation fundamentally reshapes how organizations create value, interact with stakeholders, and impact society (Vial, 2019). It is driven by new and evolving digital technologies which can be described as socio-technical systems that enable the electronic creation, processing, transmission, and storage of information (Yoo *et al.*, 2010; Baxter and Sommerville, 2011). These systems are embedded in everyday practices: smartphones that mediate communication and payments, email and digital workflows that replace paper, navigation apps that combine maps with live traffic, or smart home devices that automate household tasks. The pervasiveness of these technologies both expands organizational capabilities and multiplies the ways in which companies produce social and environmental effects (Lobschat *et al.*, 2021).

To precisely analyze the novel responsibilities arising from these pervasive effects, it is essential to first define the fundamental components that constitute these digital technologies.

Digital Technologies: Four Interacting Dimensions

Digital technologies can be conceptualized along four interrelated dimensions: hardware, software, data, and networking (Marakas and O'Brien, 2013). Hardware comprises the physical substrate that performs computation, sensing, or interaction – such as processors and sensors. Software denotes the coded logic that governs technological behavior, ranging from operating systems and applications to AI algorithms. Data forms the informational layer that fuels digital systems, including personal, operational, or sensor-generated data used for analytics or machine learning. Networking covers the infrastructures and protocols that connect devices and systems – such as the internet, 5G, or cloud platforms. These dimensions together form multilayered socio-technical assemblages whose effects cannot be reduced to any single component.

A brief example illustrates their interdependence: a smart home system depends on: (1) hardware in the form of thermostats, microphones and speakers for voice assistance, cameras, and central hubs that receive and process local signals; (2) software that includes the device-specific operating systems, AI algorithms for pattern recognition (e.g.,

recognizing faces or voices), and the central automation rules (e.g., “turn off lights when leaving”); (3) data streams generated continuously by sensors, including room temperature logs, motion data, and highly sensitive personal usage patterns (e.g., when users are home or asleep); and (4) networking technologies such as local Wi-Fi, Bluetooth for device pairing, and cloud connections to manufacturers’ servers for remote control and data storage. The four dimensions jointly determine system capabilities, vulnerabilities and social implications.

Responsibility Challenges in the Digital Era

While digital technologies promise unprecedented opportunities for innovation and efficiency, they simultaneously introduce novel challenges that transcend traditional boundaries of corporate responsibility. Consider the diverse manifestations of these challenges: Algorithmic decision-making in the hiring process balances between efficiency and the risk of discrimination (Köchling and Wehner, 2020); blockchain implementations for supply chain transparency face significant data privacy and sharing barriers (Sabeti *et al.*, 2019); and digital platforms enabling social inclusion simultaneously risk creating new forms of digital divide (Robertson *et al.*, 2024). As organizations increasingly operate in digital environments, fundamental questions emerge about how they navigate the complex intersection of technological capabilities, ethical imperatives, and stakeholder involvement.

Organizations have long recognized corporate responsibilities that transcend profit maximization, embracing obligations toward society and the environment – a concept known as Corporate Social Responsibility (CSR). Meta-analytical evidence reveals robust positive associations between CSR engagement and organizational outcomes (Orlitzky *et al.*, 2003; Vishwanathan *et al.*, 2020). Vishwanathan *et al.* (2020) identify four key mechanisms through which CSR generates value: strengthening organizational reputation, fostering stakeholder reciprocity, enhancing innovation capabilities, and mitigating organizational risks. These effects materialize because diverse stakeholder groups – including consumers, employees, investors, and local communities – hold increasingly pronounced expectations regarding corporate contributions to societal welfare and environmental stewardship. When organizations demonstrate commitment to these expectations, they generate signals of reliability and value congruence that establish legitimacy (Suchman,

1995) and create differentiation advantages in competitive markets (Carroll and Shabana, 2010; Greening and Turban, 2000; Porter and Kramer, 2006).

The complex environment introduced by the digital transformation, however, highlights why traditional CSR frameworks, while valuable for managing conventional business impacts, prove inadequate for addressing the distinctive nature of the digital transformation. This becomes apparent when examining three fundamental characteristics that distinguish digital technologies from traditional business operations (Lobschat *et al.*, 2021; Mihale-Wilson *et al.*, 2022). First, digital technologies evolve at an exponential pace, continuously spawning unforeseen opportunities and risks that outpace conventional governance mechanisms (Moore, 1965; Carl *et al.*, 2024; Mihale-Wilson *et al.*, 2021). Second, their inherent malleability enables rapid reconfiguration across applications and contexts, creating cascading effects that remain opaque and difficult to predict (Lobschat *et al.*, 2021). Third, the pervasive penetration of digital technologies throughout personal, professional, and societal spheres amplifies both the reach and intensity of organizational impacts far beyond traditional stakeholder boundaries (Lobschat *et al.*, 2021; Mihale-Wilson *et al.*, 2022). These unique properties generate technology-specific ethical dilemmas – from algorithmic bias and data privacy violations to digital exclusion – that existing CSR frameworks were not designed to address (Elliott *et al.*, 2021; Lobschat *et al.*, 2021). This perspective is supported by the value-based design literature, which metaphorically compares IT to fire: while IT enables colossal progress, it is also dangerous because it can impair human values. The current mode of IT development is describes as “playing with fire” (Spiekermann, 2016, p. xxi), which necessitates a specific, tailored responsibility approach.

This recognition has led to the emergence of Corporate Digital Responsibility (CDR) as a complementary yet distinct dimension of corporate responsibility; one that specifically addresses the unique challenges and opportunities arising from organizational deployment of digital technologies and data (Carl *et al.*, 2024; Lobschat *et al.*, 2021; Mihale-Wilson *et al.*, 2022).

Corporate Digital Responsibility: A Dual Approach

We define CDR as “an organizational practice, comprising voluntary corporate strategies and measures to identify, mitigate and prevent negative societal impacts of the creation and operation of digital technologies and data as well as to leverage them to further support societal concerns” (Schrödter and Weißenberger, 2024, p. 2; Lobschat *et al.*, 2021).

This definition implies two complementary functions of CDR: a defensive function that seeks to avoid or reduce digital harm, and a proactive function that seeks to create societal value by utilizing digital technologies. The conceptual distinction between digital footprints and handprints provides a powerful metaphor for understanding CDR’s dual nature. Digital footprints encompass not merely the environmental costs of data centers and device manufacturing, but the broader negative societal imprints left by, e.g., algorithmic decision-making, data handling practices, and potentially adverse influences on social structures. Digital handprints, conversely, represent the potential of these same technologies to create positive societal value (Cardinali and De Giovanni, 2022) – from democratizing access to information to enabling innovative solutions for social and environmental challenges. This duality is particularly significant because, unlike traditional CSR where negative externalities and positive contributions often stem from different business activities, CDR frequently involves the same digital technologies simultaneously creating risks and opportunities. A machine learning algorithm might perpetuate biases (footprint) while also enabling personalized education that reduces inequality (handprint).

To empirically distinguish and investigate these approaches, this dissertation conceptually differentiates between risk-based and opportunity-based CDR, depending on whether the respective CDR initiative focusses on digital technologies as creators of footprints or handprints:

Risk-based CDR addresses the digital footprints that arise directly from an organization’s own digital technologies and business operations. While the implementation can be strategically proactive, its focus remains defensive and protective, aimed at sustaining organizational legitimacy (Suchman, 1995) by preventing digital harms. A prominent example is Apple’s App Tracking Transparency (“ATT”) framework, mandating apps to obtain explicit user consent before tracking their activities across other companies’ apps and websites (Leswing, 2022). The digital technology dimension is central here: Apple’s

entire iOS ecosystem created the privacy risks that ATT addresses. By implementing this risk-mitigation initiative that went far beyond baseline legal requirements, Apple not only protected its users but also reinforced its legitimacy as a privacy-conscious technology leader, creating a competitive advantage while costing organizations in the advertising sector billions of dollars (Dang and Balu, 2021; Leswing, 2022). The initiative demonstrates how addressing digital footprints becomes a business case: by managing the risks inherent in their digital infrastructure, organizations can transform potential legitimacy threats into strategic advantages.

Opportunity-based CDR, on the other hand, focuses on the digital handprints by leveraging digital capabilities to address broader societal problems, particularly those not caused by the company's own digital technologies. This innovation-driven approach seeks to enhance legitimacy by demonstrating how digital technologies can be utilized for positive societal change. A prime example is the app Too Good To Go, which connects consumers with restaurants, bakeries and stores to sell surplus food at discounted prices (Middlehurst, 2023). The solution relies on digital features: the app presents locally available "surprise bags" (geolocation-based listings), and the company uses personalized messaging and push notifications to inform users about time-sensitive offers. Too Good To Go has also developed retailer-facing, AI-powered tools and forecasting features to help manage and predict surplus food, and it uses data-driven techniques to better match supply and demand. This digital approach not only generates revenue but also turns a pressing societal challenge into a business opportunity, enhancing the company's legitimacy as a technology-enabled solution provider (B Lab Global, 2025; Middlehurst, 2023). The case illustrates how opportunity-based CDR creates a business case by using digital innovation to address societal needs, thereby building legitimacy through positive impact rather than merely avoiding negative consequences.

CDR as a Business Case for Legitimacy

The strategic importance of CDR is fundamentally rooted in the concept of organizational legitimacy (Suchman, 1995). We rely on Suchman's (1995, p. 574) definition, which characterizes legitimacy as "a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions". This social acceptance – often termed the "social

license to operate” – is a critical resource for organizations, influencing their ability to attract key resources such as talent, capital, and customer loyalty (Suchman, 1995).

The digital transformation, however, has profoundly altered the requirements for achieving and maintaining this legitimacy. In the digital era, an organization’s social license is no longer solely derived from compliance with traditional regulations or conventional CSR activities but increasingly hinges on its capacity to manage the novel responsibilities arising from its use of digital technologies (Carl *et al.*, 2024; Wirtz *et al.*, 2023).

This dissertation adopts legitimacy theory as its core theoretical lens, encapsulated in the title: “Corporate Digital Responsibility: Sustaining and Enhancing Legitimacy in the Digital Era”. Sustaining Legitimacy is primarily addressed through risk-based CDR (Schrödter and Weißenberger, 2024). By proactively mitigating digital footprints (e.g., preventing algorithmic bias, ensuring data privacy beyond minimum legal requirements), organizations defend themselves against threats to their existing legitimacy and prevent stakeholder censure (Suchman, 1995). Enhancing Legitimacy is achieved through opportunity-based CDR (Schrödter and Weißenberger, 2024). By leveraging digital capabilities to create digital handprints (e.g., using AI for social good, promoting digital inclusion), organizations demonstrate their capacity for societal contribution, thereby actively building new social acceptance and reinforcing their positive identity (Cardinali and De Giovanni, 2022). By analyzing both risk-based and opportunity-based CDR, this dissertation examines the complementary mechanisms through which organizations utilize digital responsibility not only to defend against threats to their legitimacy but also to strategically enhance their reputation and social acceptance in the digital marketplace.

The pursuit of sustained and enhanced legitimacy directly translates into a measurable business case for CDR. Empirical evidence demonstrates that CDR adoption improves firm performance through multiple mechanisms: Vo Thai *et al.* (2024) found that CDR adoption improves overall firm performance, including sales growth and customer base expansion, while Oduro *et al.* (2024) showed that CDR enhances financial performance through improved firm reputation.

Beyond financial metrics, organizations implementing CDR gain crucial competitive advantages in talent acquisition (Clausen *et al.*, 2022) and in customer relationships, with Carl *et al.* (2024) demonstrating that data privacy and security initiatives create halo effects that positively influence overall consumer valuations.

However, implementing CDR is not without cost, involving what Hartley *et al.* (2024) term the “CDR calculus” – a continuous process of balancing investments in culture, governance, and management systems against potential benefits. Despite these costs, the risks of neglecting digital responsibility are severe. Organizations failing to address their digital responsibility could face not just reputational damage and legal penalties, but a fundamental erosion of legitimacy that can undermine their ability to attract customers, employees, and investors.

Given these dynamics, CDR represents not merely an optional ethical consideration but a fundamental requirement for sustaining and enhancing legitimacy in the digital age. Organizations must recognize that their ability to maintain social acceptance and competitive advantage increasingly depends on how effectively they manage both the risks and opportunities inherent in digital technologies.

2 Research Background and Gaps

Despite the growing relevance of CDR, empirical evidence remains limited. A systematic analysis of existing literature reveals a small but growing body of rigorous empirical studies that provide initial insights while highlighting the urgent need for comprehensive investigation. Understanding how CDR emerges, operates, and creates value requires examining three fundamental dimensions that capture the complete organizational responsibility cycle: the emergence of digital responsibility within organizations, the impact on and responses from stakeholders, and the strategic communication of these initiatives. These three dimensions are economically critical as they determine how organizations build legitimacy in digital markets, secure stakeholder support for digital initiatives, and translate responsibility efforts into competitive advantages (Oduro *et al.*, 2024; Vo Thai *et al.*, 2024).

The Emergence of Digital Responsibility

The first critical dimension examines how digital responsibility emerges within organizations and becomes embedded in corporate practices. This dimension is economically vital because it determines whether CDR becomes a source of competitive advantage or merely a compliance burden (Lobschat *et al.*, 2021). Understanding the mechanisms through which organizations recognize, adopt, and institutionalize digital responsibility

shapes their ability to proactively address digital challenges rather than reactively respond to crises.

Trittin-Ulbrich and Böckel (2022) provide foundational insights through their qualitative research examining institutional entrepreneurship in Germany. Institutional entrepreneurs are actors who mobilize resources to create new institutions or transform existing ones, acting as catalysts for organizational change (Maguire *et al.*, 2004). Their study reveals how these change agents build legitimacy for CDR through three distinct practices. Discursive practices involve the strategic framing of CDR to create pragmatic and cognitive legitimacy – for instance, crafting arguments that highlight monetary benefits such as expanded customer bases through improved accessibility. Material practices include developing concrete tools like CDR guidelines and assessment frameworks that organizations can implement. Relational practices involve building coalitions across business, civil society, and policy domains to establish CDR as a legitimate business concern. These practices collectively work to position responsible digital innovation as both desirable and appropriate for businesses navigating digital transformation.

Vo Thai *et al.* (2024) complement this institutional perspective by examining internal organizational factors. Their analysis of 2,106 Southeast Asian enterprises demonstrates that human capital quality and stakeholder engagement intensity significantly influence CDR strategy formulation and implementation. Organizations with higher employee education levels and technical expertise show greater capability to recognize digital responsibility opportunities and challenges. Moreover, companies with established stakeholder dialogue mechanisms more effectively translate external expectations into CDR initiatives. This suggests that CDR emergence depends not only on external institutional forces but also on internal organizational capabilities and engagement structures.

The relationship between digitalization and traditional CSR provides another lens for understanding CDR emergence. While several studies establish positive connections – Cardinali and De Giovanni (2022) find digital technology adoption enhances CSR performance, Yang and Han (2023) demonstrate digital transformation improves ESG outcomes, and Zheng and Zhang (2023) show it enhances green innovation through CSR mediation. Though, contradictory evidence from Cao *et al.* (2025) reveals complexity. Their finding that digital transformation promotes social responsibility while inhibiting

environmental responsibility suggests organizations may perceive trade-offs between different responsibility dimensions, highlighting the need to understand how managers navigate these tensions.

Elliott and Copilah-Ali (2024) provide crucial implementation insights through their United Kingdom software consultancy case study. They identify three primary barriers to CDR emergence: the persistence of tick-box mentalities that treat CDR as a compliance exercise rather than strategic opportunity, substantial time requirements for meaningful implementation that conflict with short-term business pressures, and the necessity of genuine leadership commitment beyond superficial endorsement. These findings emphasize that CDR emergence requires fundamental shifts in organizational mindsets and resource allocation.

Stakeholder Impact and Perception of Digital Responsibility

The second dimension focuses on how CDR affects various stakeholder groups and shapes their responses. This dimension is crucial because stakeholder perceptions determine whether CDR investments translate into enhanced reputation, customer loyalty, employee attraction, and ultimately financial performance (Oduro *et al.*, 2024). Organizations must understand not only whether stakeholders value digital responsibility but also which specific initiatives resonate with different stakeholder segments.

Herden *et al.* (2021) provide comprehensive empirical evidence through their survey of 509 United States respondents examining public perceptions of digitalization's opportunities and threats. Their findings reveal a nuanced stakeholder landscape where opportunities such as improved services, reduced repetitive work, and enhanced accessibility are viewed positively, while threats including cybercrime risks, data security concerns, and privacy violations rank as primary worries. This duality suggests stakeholders simultaneously expect organizations to leverage digital opportunities while mitigating digital risks, creating complex and sometimes contradictory expectations for CDR initiatives.

Carl *et al.* (2024) advance understanding of stakeholder preferences through choice experiments revealing that data privacy and security initiatives create strong halo effects. Their research demonstrates that privacy concerns significantly influence consumers' overall valuation of CDR initiatives, with privacy-focused activities enhancing perceptions of other CDR dimensions even when not directly related. Importantly, they identify

heterogeneous consumer segments with distinct CDR preferences: privacy fundamentalists who prioritize data protection above all else, pragmatists who balance privacy with service benefits, and the unconcerned who show minimal privacy sensitivity. This segmentation indicates that uniform CDR strategies may fail to address diverse stakeholder expectations.

The financial implications of CDR for stakeholder value creation emerge clearly from recent quantitative studies. Oduro *et al.* (2024) demonstrate that while CDR lacks direct impact on financial performance, firm reputation fully mediates this relationship. Their analysis reveals that CDR initiatives must first enhance organizational reputation among stakeholders before translating into financial benefits, highlighting the critical intermediary role of stakeholder perceptions. Vo Thai *et al.* (2024) provide supporting evidence that CDR adoption improves firm performance metrics including sales growth and customer base expansion, suggesting that stakeholders reward organizations demonstrating digital responsibility through increased patronage and loyalty. Wang and Aw (2026) extend this performance perspective into the realm of AI by demonstrating that environmental, economic, and technological CDR dimensions are critical antecedents for AI-based partner relationship management. Their empirical analysis of the Chinese banking sector reveals that these CDR dimensions drive sustainable firm performance – encompassing environmental, financial, and social outcomes – primarily through the mediation of AI-enabled collaborative capabilities.

Communication and Disclosure of Digital Responsibility

The third dimension examines how organizations communicate their digital responsibility efforts to stakeholders and society. This dimension is essential because even exemplary CDR implementation cannot create value without effective communication to relevant audiences (Connelly *et al.*, 2011). The inherent invisibility of many digital processes – from algorithmic decision-making to data governance protocols – makes strategic communication particularly critical for CDR.

Current disclosure practices reveal significant gaps in CDR communication. Merbecks (2024) analyzed non-financial reports from German DAX 30 companies, finding a noteworthy asymmetry: while organizations actively disclose customer and employee-focused CDR initiatives that enhance their image, they completely neglect reporting

CDR-related risks that might raise concerns. This selective disclosure suggests organizations view CDR communication primarily as reputation management rather than genuine transparency, potentially undermining stakeholder trust when undisclosed risks materialize.

The specific challenge of algorithmic transparency illustrates broader communication complexities. Bonsón *et al.* (2023) analyzed 962 Western European corporate reports from 337 companies, finding algorithmic decision-making disclosure remains rare and unstandardized despite growing regulatory attention. When organizations do disclose algorithmic practices, the information typically lacks sufficient detail for stakeholders to assess fairness, accuracy, or potential biases. This communication deficit is particularly problematic given that algorithmic systems increasingly influence critical decisions affecting employment, credit, insurance, and service access.

Clausen *et al.* (2022) explore how organizations signal commitment to ethical AI through various communication mechanisms. Their research identifies multiple signaling strategies including obtaining certifications, publishing ethical AI principles, establishing oversight committees, and engaging in industry initiatives. However, they find substantial variation in signal credibility, with stakeholders increasingly distinguishing between substantive commitments backed by concrete actions versus symbolic gestures lacking implementation substance. This suggests that effective CDR communication requires alignment between disclosure and actual practices.

Research Gaps

This systematic review reveals critical gaps requiring investigation. Most fundamentally, while existing research has identified various dimensions of CDR (e.g., Carl *et al.*, 2024; Carl and Hinz, 2024; Herden *et al.*, 2021), it has not empirically examined the critical distinction between risk-based CDR and opportunity-based CDR. This specific duality – whether CDR addresses technology as a source of problems or as a solution – remains unexplored, despite its potential to fundamentally shape organizational approaches and stakeholder responses. Beyond this overarching gap, several more specific limitations emerge.

In the first field, while studies document CDR adoption patterns (Elliott and Copilah-Ali, 2024; Vo Thai *et al.*, 2024), they largely overlook how institutional forces and mechanisms drive companies to embrace digital responsibility in the first place. Understanding

these institutional dynamics is important because they determine whether CDR becomes embedded as a taken-for-granted expectation or remains a discretionary activity. Without knowing which institutional pressures – coercive, mimetic, or normative – most effectively promote digital compliance as the foundation of CDR, policymakers lack guidance for creating supportive regulatory frameworks, and managers cannot anticipate future institutional developments. The question of how digital compliance becomes institutionalized is particularly relevant given the rapid evolution of digital regulations like GDPR and AI Acts that create new compliance baselines from which voluntary CDR initiatives must differentiate themselves.

Additionally, existing studies in the first field focus on organizational-level phenomena, neglecting the individual managers who ultimately decide whether and how to implement CDR initiatives. This gap is critical because even when institutional pressures exist and stakeholder benefits are recognized, the translation into organizational action depends on managerial decision-making processes. Without understanding what cognitive factors (ethical judgments), social influences (stakeholder pressures), and practical constraints (organizational capabilities) shape managers' CDR decisions, organizations cannot design effective internal governance structures or incentive systems. The distinction between risk-based and opportunity-based CDR may be particularly relevant here, as different types of initiatives might activate different decision-making processes – defensive compliance mindsets versus innovative opportunity recognition.

In the second field, although stakeholder perspectives are acknowledged as critical for CDR success (Herden *et al.*, 2021; Carl *et al.*, 2024), no research systematically compares how stakeholders evaluate CDR versus traditional CSR initiatives when controlling for effectiveness. This comparison is essential because organizations need to understand whether investing in digital responsibility initiatives yields different stakeholder responses than traditional CSR investments of equal magnitude. If stakeholders perceive CDR and CSR as interchangeable, organizations may lack incentives to develop specialized digital responsibility capabilities. Conversely, if stakeholders value one over the other, this shapes strategic resource allocation decisions. The potential distinction between opportunity-based and risk-based approaches adds further complexity – understanding whether stakeholders reward proactive digital innovation for social good

differently than defensive risk mitigation directly influences which CDR strategies organizations should pursue.

Finally, in the third field, research has not yet investigated how the inherent observability of CDR initiatives influences organizations' strategic communication choices. This gap matters because many CDR activities – from algorithmic governance to data protection protocols – remain invisible to external stakeholders unless actively communicated (Flyverbom, 2016). Organizations face a fundamental tension: they must communicate unobservable CDR efforts to capture reputational benefits (Connelly *et al.*, 2011), yet excessive communication about easily observable initiatives may appear redundant or manipulative (Ashforth and Gibbs, 1990; Carlos and Lewis, 2018). Understanding how observability shapes communication strategies for risk-based versus opportunity-based CDR is essential for helping managers allocate communication resources more effectively and set appropriate expectations for communication outcomes.

3 Outline of the Dissertation

These gaps collectively reveal that while CDR is recognized as important, fundamental questions about its institutionalization, stakeholder valuation, managerial adoption, and strategic communication remain unanswered. The distinction between risk-based and opportunity-based CDR emerges as a critical theoretical lens that may explain variations across all these dimensions. This dissertation therefore undertakes a systematic investigation across institutional, organizational, and individual levels to provide comprehensive insights into the CDR phenomenon.

The overarching research question guiding this work is:

What drives the adoption, implementation, and communication of CDR in organizations, and how does the dual nature of CDR – as mitigating digital risks versus leveraging digital opportunities – shape these processes and the impact on stakeholder perceptions?

To answer this comprehensive question, the dissertation comprises four distinct research papers that examine complementary aspects of the CDR phenomenon:

- Paper 1: The Institutionalization of Digital Compliance
- Paper 2: Next-Level CSR? Exploring the Comparative Impact of Corporate Digital Responsibility on Stakeholder Preferences
- Paper 3: Between Handprints and Footprints: Controlling Decision-Making in Corporate Digital Responsibility
- Paper 4: Substantive vs. Symbolic: Strategic Communication of Corporate Digital Responsibility under Observability

The distinction between risk-based and opportunity-based CDR is woven throughout the dissertation (though merely implicitly in Paper 1).

To systemize these aspects of CDR, the dissertation adopts a multi-level framework, examining the phenomenon at the macro-level of the institutional environment, the meso-level of the organization, and the micro-level of the individual manager. This structure allows for a holistic analysis that traces the influence of external forces on internal choices and subsequent organizational behavior. Figure A-2 illustrates this multi-level framework and the positioning of the four papers within it.

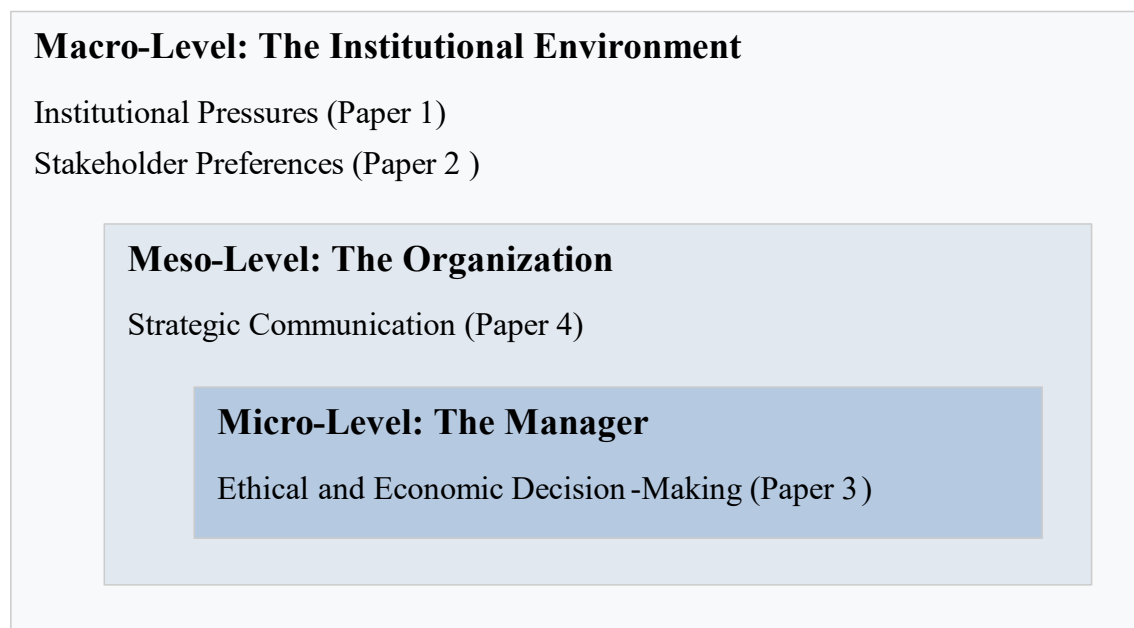


Figure A-1: A Multi-Level Framework for the Dissertation

The investigation begins at the macro-level, establishing the broader context in which organizations operate. We explore this external environment from two complementary perspectives. First, Paper 1, “The Institutionalization of Digital Compliance”, examines the institutional drivers that compel organizations to adopt foundational CDR practices. By analyzing coercive, mimetic, and normative forces, this study explains why CDR appears on the corporate agenda in the first place. The second paper at the macro-level, Paper 2, “Exploring the Comparative Impact of Corporate Digital Responsibility on Stakeholder Preferences”, investigates the external valuation of these initiatives. It assesses how stakeholders perceive and value CDR in comparison to traditional CSR, which ultimately determines the strategic relevance of these activities and creates a feedback loop that shapes future institutional norms.

While these macro-level forces create the context for CDR, the actual decision to implement specific initiatives is made by individuals within the company. Paper 3, “Between Handprints and Footprints: Controlling Decision-Making in Corporate Digital Responsibility”, therefore investigates the micro-level to explore this “black box” of managerial intention-forming. It applies an integrated behavioral model to identify distinct cognitive, social, and non-volitional factors explaining how individual actors within the organization choose to implement CDR initiatives.

Finally, a manager’s intention must be translated into corporate actions and effective communication to influence stakeholder perceptions and, consequently, maintain legitimacy and gain competitive advantages. The analysis thus concludes by examining the meso-level of the organization as a strategic actor. Paper 4, “Substantive vs. Symbolic: Strategic Communication of Corporate Digital Responsibility under Observability”, analyzes the strategic communication of CDR initiatives and how the inherent observability of these actions moderates the relationship between implementation and disclosure. This final paper bridges the gap between internal decision-making and external perception. In doing so, it completes the analytical circle by examining the strategic communication through which the organization addresses the very stakeholders and institutional pressures that formed the starting point of this dissertation’s analysis.

To address the overarching research question comprehensively, the empirical foundation of this dissertation is built upon two data collection strategies:

Quantitative Surveys (Papers 1, 3, and 4): To investigate institutionalized practices and underlying managerial logics, extensive surveys were conducted. Paper 1 utilizes a dataset of 162 predominantly large German companies. Papers 3 and 4 are based on a telephone interview survey of 187 managers from small and medium-sized enterprises in North Rhine-Westphalia. This methodology is particularly suited for testing complex statistical relationships, such as the moderating effects of organizational agility or observability, within real-world organizational contexts.

Vignette Experiment (Paper 2): To isolate the causal relationship between CDR initiatives and stakeholder preferences while mitigating endogeneity concerns, a 3x2 within-subjects experimental design with 150 participants was employed. The use of vignettes allows for the systematic manipulation of hypothetical scenarios (e.g., CSR vs. CDR), thus uncovering precise preference patterns.

The data acquisition for Papers 2, 3, and 4 was facilitated and funded by the European Regional Development Fund through the project “CSR.digital” (2020-2023). CSR.digital served as a bridge between academia and the business community, supporting small and medium-sized enterprises in responsibly shaping digital transformation and providing access to highly relevant practical research questions. All the studies were conducted independently, ensuring that the research designs, data collection, analyses, and interpretation of results were not influenced by the funding organizations.

Table A-1 offers an overview of all four papers.

Table A-1: Papers of the Dissertation

	Paper 1	Paper 2	Paper 3	Paper 4
Title	The Institutionalization of Digital Compliance	Next-Level CSR? Exploring the Comparative Impact of Corporate Digital Responsibility on Stakeholder Preferences	Between Handprints and Footprints: Controlling Decision-Making in Corporate Digital Responsibility	Substantive vs. Symbolic: Strategic Communication of Corporate Digital Responsibility under Observability
Research Question	Which institutional forces drive the adoption of digital compliance as a foundational element of CDR?	Do stakeholders (customers, prospective employees) prefer CDR initiatives over traditional CSR initiatives? Do they differentiate between opportunity- and risk-based CDR?	What cognitive (judgment, attitude), social (subjective norm), and nonvolitional (perceived control) factors influence managers' intentions to implement CDR? Does this decision-logic differ for opportunity-based versus risk-based initiatives?	Does the observability of CDR initiatives moderate the relationship between their implementation and their strategic communication? Does this effect differ for opportunity-based versus risk-based CDR?
Methodology & Sample	Survey 162 participants, 2018	Vignette experiment 150 participants, 2022	Survey 187 participants, 2022	Survey 187 participants, 2022

(continued on next page)

	Paper 1	Paper 2	Paper 3	Paper 4
Results	Mimetic forces (competitor knowledge) and normative forces (professional standards) significantly drive adoption. Coercive customer pressure has no significant impact, positioning digital compliance as an institutionalized “must-be” baseline that lacks strategic differentiation value.	When effectiveness is equal, stakeholders show no preference for CDR over CSR (customers even significantly favor traditional CSR). The distinction between opportunity-based and risk-based CDR also does not influence preferences either. Stakeholders value the outcome, not the means.	Managers apply distinct logics depending on the CDR type. Risk-based CDR decisions are driven by economic evaluations (attitude). Opportunity-based CDR decisions are driven by organizational capabilities (perceived behavioral control) and stakeholder expectations (subjective norm). Ethical considerations (judgment) fail to predict implementation intentions in any model.	Risk-based CDR communication is an institutional imperative; it shows a consistent positive relationship with action that is not moderated by observability. Opportunity-based CDR communication exhibits strategic discretion; observability does significantly moderate the relationship, revealing compensatory symbolic management when underperformance is highly observable.
Co-Authors	Barbara E. Weißenberger	Barbara E. Weißenberger	Barbara E. Weißenberger	Barbara E. Weißenberger
Personal Contribution	70% (design, theory development, data analysis, paper writing)	90% (design, theory development, data gathering and analysis, paper writing)	90% (design, theory development, data gathering and analysis, paper writing)	90% (design, theory development, data gathering and analysis, paper writing)
State of Publication	Published in Management Decision	./.	In preparation for submission to Review of Managerial Science	Submitted to Corporate Social Responsibility and Environmental Management
Presentations	11 th Annual Conference on Risk Governance (Siegen, 2023)	Workshop on Experimental Research in Behavioral Management Accounting and Control (Düsseldorf, 2023)	85 th VHB Annual Conference (Göttingen, 2026) Joint Workshop with the Institute of Management Accounting and Simulation, Hamburg University of Technology (Düsseldorf, 2024)	./.

4 Overview of Papers

4.1 The Institutionalization of Digital Compliance

The dissertation's multi-level investigation begins at the macro-level, addressing the institutional environment that shapes organizational action. Paper 1, "The Institutionalization of Digital Compliance", serves as the foundational pillar for the entire thesis. It is strategically positioned first to address the most fundamental question of the research framework's "emergence" dimension: Why do organizations adopt foundational digital responsibility practices in the first place? This paper argues that before organizations can leverage CDR for strategic enhancement, they must first secure their baseline legitimacy. This is achieved by addressing the defensive, risk-mitigating aspects of digitalization, which this paper conceptualizes as "digital compliance" – a core component of the risk-based CDR detailed in the introduction.

The paper addresses a critical gap identified in the literature review. While scholars have begun to document CDR adoption patterns (Vo Thai *et al.*, 2024; Trittin-Ulbrich and Böckel, 2022), the underlying institutional forces that compel organizations to embrace these foundational practices remained largely unexplored. To close this gap, the paper employs institutional theory, specifically DiMaggio and Powell's (1983) framework, as its primary theoretical lens. The central research question is: "Which institutional forces drive the adoption of digital compliance as a foundational element of CDR?". It investigates whether organizations adopt data security and protection measures because they are forced to (coercive pressure), because their competitors are doing it (mimetic forces), or because it is considered the "proper" thing to do by professional networks (normative forces).

To answer this question, the study utilizes survey data from 162 predominantly large German companies. Using OLS regressions, it tests the impact of these three institutional pressures on the implementation of digital compliance. The findings are essential for the dissertation's overarching narrative:

Mimetic forces, proxied by competitor knowledge, show a substantial and significant positive effect on digital compliance adoption. Normative forces, measured via professional information input, are also found to be influential drivers. Coercive forces, specifically operationalized as the interaction with customers, have no significant impact.

The primary contribution of Paper 1 is not just identifying what drives compliance, but also what does not. The non-finding for customer pressure is the critical connection between Paper 1 and the subsequent studies. This result strongly suggests that digital compliance (like data privacy and security) has already passed the threshold of being a strategic differentiator. Instead, it has become an institutionalized, “taken-for-granted” expectation – a “must-be” requirement in the Kano sense (Carl *et al.*, 2024; Kano *et al.*, 1984; Matzler *et al.*, 1996). Customers do not actively pressure firms for it because they assume it is being handled; its absence would lead to stakeholder censure and a fundamental loss of legitimacy, but its mere presence generates no competitive advantage. This “must-be” finding raises the immediate follow-up question that motivates Paper 2: If stakeholders take the risk-based baseline for granted, how do they then evaluate voluntary CDR initiatives that go beyond this compliance level, particularly in comparison to traditional CSR?

This paper also sets the macro-level stage for the micro-level analysis in Paper 3. It identifies the external institutional pressures (mimetic and normative) that exist in the environment, which Paper 3 will then trace into the “black box” of the company to understand how these forces are perceived and processed by individual managers.

Finally, Paper 1 provides the conceptual anchor for Paper 4. By defining compliance as an institutionalized, risk-based activity, it establishes the context to investigate the logical follow-up question of how organizations strategically communicate such baseline requirements, a question Paper 4 will explore in detail.

4.2 Next-Level CSR? Exploring the Comparative Impact of Corporate Digital Responsibility on Stakeholder Preferences

Following the foundational analysis of institutional drivers in Paper 1, the dissertation’s second study remains at the macro-level to investigate the stakeholder preferences component of the institutional environment. Paper 2, “Next-Level CSR? Exploring the Comparative Impact of Corporate Digital Responsibility on Stakeholder Preferences”, directly builds upon the central finding from the first paper to address the next logical step in the dissertation’s overarching narrative.

Building on Paper 1’s finding that foundational digital compliance is an unrewarded “must-be” requirement (Carl *et al.*, 2024; Kano *et al.*, 1984; Matzler *et al.*, 1996), this study addresses the critical follow-up question: Do organizations gain a strategic

advantage by voluntarily investing in proactive CDR initiatives that go beyond this baseline? And crucially, is this digital form of responsibility perceived as superior to traditional CSR?

The literature review identified this as a critical gap: while CDR is conceptually posited as a distinct and strategically vital field (Carl *et al.*, 2024; Lobschat *et al.*, 2021; Mihale-Wilson *et al.*, 2022), no research had systematically compared stakeholder valuations of CDR versus traditional CSR while controlling for their tangible impact. The paper thus addresses two core research questions: Do stakeholders prefer CDR initiatives over traditional CSR initiatives; and do stakeholders differentiate between opportunity-based and risk-based CDR?

To frame the hypotheses, we draw on a synthesis of signaling theory (Spence, 1973), social identity theory (Tajfel and Turner, 1986), and expectation-disconfirmation theory (Oliver, 1977, 1980). The unique characteristics of digital technologies (Lobschat *et al.*, 2021), suggest that the innovation and technological sophistication of digital technologies would act as a powerful signal, leading stakeholders to form stronger positive preferences for CDR initiatives compared to their traditional counterparts.

To test this, the paper employs a vignette experiment with 150 participants assigned to the roles of either customer or prospective employee. This experimental design is the paper's key methodological strength, as it allows for the strict isolation of the variable of interest: the nature of the initiative (traditional versus digital; risk-based versus opportunity-based). This is achieved by holding the outcome and effectiveness of all initiatives constant across the scenarios.

The results of the experiment are striking and provide one of the most significant “plot twists” of the dissertation:

No CDR Superiority: The central hypothesis is rejected. Stakeholders, particularly prospective employees, show no significant preference for CDR over traditional CSR when their societal impact is identical. The “digital” label does not automatically confer a strategic advantage.

Customer Preference for CSR: Even more surprisingly, customers actually show a statistically significant preference for traditional CSR initiatives over their equally effective digital counterparts. The paper's challenging title, “Next-Level CSR?”, is thus answered with a decisive “no” from the customer's perspective.

No Differentiation Between CDR Types: The study also finds no evidence that stakeholders differentiate between opportunity-based and risk-based CDR.

The paper's overarching conclusion is that stakeholders are fundamentally outcome-oriented. They evaluate responsibility initiatives based on their tangible societal impact (the "what"), not on the technological sophistication of their implementation (the "how").

This paper's findings are a critical basis for the entire dissertation, creating the central tension for Papers 3 and 4 to resolve.

First, this monolithic stakeholder perception creates a sharp conceptual puzzle, which forms the central research question for Paper 3. If external stakeholders view CDR monolithically and do not distinguish between its "footprint" (risk-based) and "handprint" (opportunity-based) approaches, does this distinction matter internally? Paper 3 thus investigates the "black box" of the company to explore whether this external indifference is mirrored in managerial decision-making, or if a "perception-reality-gap" exists.

Second, these findings provide the crucial context for Paper 4. If organizations cannot rely on the "digital" or "AI" buzzword to automatically enhance legitimacy, the role of strategic communication becomes vital. This raises the question of how organizations communicate these different initiatives. Paper 4, therefore, picks up this thread to investigate whether organizations' communication strategies reflect the monolithic view of stakeholders (from Paper 2) or if they follow a different, more nuanced internal logic.

4.3 Between Handprints and Footprints: Controlling Decision-Making in Corporate Digital Responsibility

The dissertation now moves on from the macro-level institutional environment to the micro-level of the individual decision-maker. Paper 3, "Between Handprints and Footprints: Controlling Decision-Making in Corporate Digital Responsibility", is strategically positioned as the core of the thesis. It zooms in to open the "black box" of the company, addressing how the external pressures and stakeholder perceptions analyzed in the first two papers are translated into tangible corporate action by individual managers.

This paper is motivated by the potential "perception-reality gap" indicated by the preceding studies. Paper 2 demonstrated that external stakeholders evaluate CDR monolithically, ignoring the distinction between risk-based and opportunity-based initiatives. This creates a significant puzzle: If this distinction is irrelevant to the market, is it relevant to managers? Or do they mirror this external indifference? The literature review confirmed

this as a critical gap, noting that research had focused on macro-drivers while neglecting the individual, micro-level cognitive processes of the managers who must ultimately make the implementation decisions.

Paper 3 confronts this puzzle by inverting the perspective. It hypothesizes that this distinction – while invisible to external stakeholders – may be a critical factor in shaping internal managerial decision-making. The paper’s central research question is therefore: “What cognitive, social, and nonvolitional factors influence managers’ intentions to implement CDR?”.

To answer this question, the paper first develops a novel integrated theoretical model for CDR decision-making. This model was necessary because existing frameworks were insufficient for the unique context of CDR: Rest’s (1986) four-component model, while capturing the moral component, is not able to handle the vital economic and resource-based constraints of a business setting. Ajzen’s (1991) theory of planned behavior is robust for predicting behavioral intention based on practical factors (attitude, norms, control) but lacks an explicit dimension for moral reasoning, which is central to any responsibility concept. The paper’s integrated model synthesizes these two, retaining the structure of the theory of planned behavior but crucially splitting the attitude construct into Rest’s judgment, defined as the manager’s ethical evaluation of an initiative, and attitude, defined as the manager’s economic and strategic evaluation (the business case). This separation allows the model to test whether managers are driven by moral conviction or pragmatic calculation.

The model is tested using survey data from 187 German managers. The analysis yields four critical findings:

The Monolithic Illusion: When all CDR initiatives are pooled and analyzed as a single, unified construct (mirroring the stakeholder view from Paper 2), the model has relatively weak explanatory power. The only significant predictor of implementation intention is perceived behavioral control. This suggests that, viewed monolithically, CDR is simply a matter of having the capability and resources to act.

The Dual-Logic Reality: However, the paper’s key contribution comes from its exploratory supplemental analysis, which disaggregates the data into opportunity-based and risk-based initiatives. This reveals two fundamentally different decision-making logics that were masked in the pooled data. For risk-based CDR, the intention to implement is

driven primarily by attitude (the economic evaluation). This is a defensive, compliance-oriented logic, consistent with March's (1991) "exploitation". Managers ask: What are the costs, benefits, and risks of (not) doing this? For opportunity-based CDR, the intention to implement is driven dominantly by perceived behavioral control (organizational capabilities) and, to a lesser extent, by subjective norm (stakeholder expectations). This is a proactive, innovative logic, consistent with "exploration". Managers ask: Can we do this? Do we have the skills, technology, and resources? And does anyone (i.e., stakeholders) want us to?

The Pragmatic Manager: In a finding that challenges the very premise of "ethical decision-making", judgment (moral evaluation) is non-significant in all models. Managers are not driven by whether a CDR initiative is "the right thing to do" but by whether it is economically reasonable (for risk-based CDR) or organizationally feasible (for opportunity-based CDR).

The Intention-Action Gateway: The relationship between intention and action (actual implementation) is exceptionally strong and significant across all models. This confirms that understanding the antecedents of intention is the critical hurdle.

Paper 3 is the dissertation's analytical core. It resolves the central tension from Paper 2 by demonstrating the existence of a perception-reality gap: the opportunity- versus risk-based distinction, which is irrelevant to external stakeholders (Paper 2), is a crucial factor determining internal managerial action (Paper 3).

This paper connects the entire thesis by providing the micro-foundations for the macro-level findings of Paper 1, showing how institutional pressures are processed through a managerial calculus focused on economics (for risks) and capabilities (for opportunities). Most importantly, it provides the indispensable "why" for Paper 4. The discovery that internal implementation logics for risk-based and opportunity-based CDR are fundamentally different raises the logical next question, which Paper 4 investigates: Do these distinct internal logics also manifest as distinct external communication strategies?

4.4 Substantive vs. Symbolic: Strategic Communication of Corporate Digital Responsibility under Observability

The dissertation's final paper, "Substantive vs. Symbolic: Strategic Communication of Corporate Digital Responsibility under Observability", transitions the focus to the meso-level. It completes the analytical circle by investigating the logical consequence of Paper

3's findings: If managers utilize fundamentally different internal logics for risk-based and opportunity-based CDR, do these differences manifest as fundamentally different external communication strategies?

This paper addresses a fundamental challenge characteristic for CDR: its inherent invisibility. Many digital responsibility initiatives – such as algorithmic governance, data privacy protocols, or internal ethical training – are opaque to external stakeholders (Flyverbom, 2016). Without deliberate communication, these efforts cannot enhance legitimacy or create a competitive advantage (Connelly *et al.*, 2011; Oduro *et al.*, 2024; Porter and Kramer, 2006; Suchman, 1995). While prior literature has acknowledged the need for CDR disclosure, it has treated CDR communication as a monolithic construct. This approach, however, overlooks the dual-logic framework established in Paper 3 and fails to consider how the natural visibility (observability; Bernstein, 2012) of an action might alter the need to communicate it.

This leads to the paper's central research question: “Does the observability of CDR initiatives moderate the relationship between their implementation and their strategic communication?”. This question is explored by developing a dual theoretical framework: Legitimacy theory (Suchman, 1995) is applied to the defensive, “exploitation” logic of risk-based CDR, while signaling theory (Spence, 1973) is applied to the proactive, “exploration” logic of opportunity-based CDR.

Using the same survey data from 187 German managers as in Paper 3, this study regresses CDR communication intensity against the interaction of CDR action (implementation) and the perceived observability of those actions, for both CDR types separately. The findings are striking and reveal two completely distinct communication patterns operating within the same companies:

Risk-Based CDR – A Logic of Institutional Imperative: The analysis finds a strong, significant, and consistent positive relationship between risk-based action and communication intensity. Most importantly, as hypothesized, this relationship is not moderated by observability. Organizations communicate their risk-mitigating actions with the same intensity regardless of whether stakeholders can already see them or not. This supports the paper's argument that risk-based CDR communication is not a strategic choice but an institutional imperative. It is a non-discretionary act of legitimacy maintenance, essential

for demonstrating conformity with societal norms and addressing the attribution problem, i.e., getting credit for problems that do not occur (Repenning and Sterman, 2001).

Opportunity-Based CDR – A Logic of Strategic Discretion: In stark contrast, the communication of proactive opportunity-based CDR initiatives is not straightforward. The relationship is complex and is significantly moderated by observability. When opportunity-based actions are less invisible, the logic follows classic signaling theory, i.e., more action leads to more communication. This is a genuine attempt to bridge the information asymmetry and signal quality (Connelly *et al.*, 2011; Spence, 1973). Under high observability the relationship inverts, so that at high levels of action, communication is less intense (as actions “speak for themselves”; Ashforth and Gibbs, 1990; Carlos and Lewis, 2018). However, at low levels of action, organizations engage in paradoxically intensive communication. The paper identifies this as compensatory symbolic management (Ashforth and Gibbs, 1990) – a strategic, and potentially deceptive, use of communication to mask visible underperformance and manage the legitimacy threat it poses.

5 Conclusion

This dissertation pursued a comprehensive investigation into CDR, guided by the overarching research question: What drives the adoption, implementation, and communication of CDR in organizations, and how does the dual nature of CDR – as mitigating digital risks versus leveraging digital opportunities – shape these processes and the impact on stakeholder perceptions? Through a multi-level framework, the four constituent papers have systematically analyzed the institutional, individual, and organizational dimensions of this phenomenon. The findings, when synthesized, reveal a complex and coherent narrative characterized by a core, unifying tension: a profound disconnect between the internal reality of managerial decision-making and external stakeholder perceptions.

The investigation began at the macro-level, establishing the institutional context. Paper 1 revealed that the foundation of risk-based CDR – digital compliance – has already achieved widespread adoption. This institutionalization is driven not by active stakeholder pressure, but by professional standards and competitive mimicry. This finding positioned basic digital responsibility as a “must-be” requirement, a non-negotiable baseline for sustaining legitimacy rather than a tool for differentiation.

This insight provided the critical launching point for Paper 2, which examined the external valuation of initiatives that go beyond this baseline. The experimental results were striking: external stakeholders are fundamentally outcome-oriented. They demonstrated no significant preference for “digital” CDR over traditional, non-digital CSR when effectiveness was held constant. More importantly, they showed no differential preference between risk-based and opportunity-based CDR initiatives. From the external stakeholder’s viewpoint, CDR is evaluated as a monolithic concept, where only the tangible societal impact matters, not the technological means.

This finding of external stakeholder indifference stands in sharp contrast to the internal organizational realities uncovered in Paper 3. The micro-level investigation of managerial decision-making revealed that the very distinction that stakeholders ignore – the difference between risk-based and opportunity-based CDR – is, in fact, a significant factor shaping internal implementation decisions. The dissertation demonstrated that treating CDR as a unified construct masks two fundamentally different logics: Risk-based CDR implementation is driven primarily by economic evaluations (an “exploitation” logic), while opportunity-based CDR is driven by organizational capabilities (an “exploration” logic) and, to a lesser extent, stakeholder involvement. Notably, across both logics, pragmatic calculations (economic or capability-based) superseded purely ethical considerations.

Finally, Paper 4 completed the analytical circle at the meso-level, demonstrating how this deep-seated internal, cognitive divide translates directly into the organization’s external communication strategy. The two distinct managerial logics from Paper 3 result in two fundamentally different communication patterns. Risk-based communication operates as an institutional imperative. It is a non-discretionary act of legitimacy maintenance, showing a steady relationship with implementation that is not affected by observability. Opportunity-based communication functions as a strategic choice. It is highly discretionary, fluctuating significantly with observability and even being used as a compensatory symbolic tool to manage perceptions of visible underperformance.

The central contribution of this dissertation lies in the identification and multi-level deconstruction of this perception-reality gap. It challenges monolithic views of CDR by demonstrating that organizations employ a sophisticated, dual-logic system internally

(Papers 3 and 4) for a phenomenon that the external market currently evaluates monolithically (Paper 2).

These insights provide a robust and nuanced foundation for future research. They also carry significant practical implications, highlighting a critical strategic misalignment for managers. Firms must recognize that the internal logics driving their CDR investments are not the same logics that drive external valuation. This suggests a need to either educate stakeholders on the value of different CDR approaches or, perhaps more effectively, re-focus communication away from the means (the “digital” or “risk/opportunity” framing) and towards the ends (the tangible societal outcomes) that stakeholders ultimately reward. By systematically connecting the macro, micro, and meso-levels, this dissertation provides a comprehensive and integrated answer to its guiding research question, offering a new and more precise understanding of how organizations navigate their responsibilities in the digital era.

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B The Institutionalization of Digital Compliance

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The Institutionalization of Digital Compliance

Abstract

This research investigates how companies institutionalize digital compliance, particularly data security and protection, as a fundamental aspect of Corporate Digital Responsibility (CDR), addressing a key gap in the literature. Drawing on institutional theory, we assess the impact of coercive, mimetic and normative forces on digital compliance through survey data from 162 predominantly large German companies, analyzed using ordinary least squares regressions. Our analysis revealed that mimetic forces, driven by competitor knowledge, substantially affect digital compliance. Normative forces related to professional knowledge are also influential, while coercive forces exerted by customers have no significant impact. Furthermore, a supplemental analysis highlights the moderating role of organizational agility in these relationships.

While these findings provide important insights, CDR extends beyond digital compliance. Future research should explore higher levels of CDR and consider stakeholders beyond customers. Additionally, our focus on large German companies may limit generalizability. Despite these limitations, the findings underscore the importance of understanding competitive landscapes and professional discourses. Managers should therefore be aware of these institutional forces and incorporate them into strategic planning for digital compliance and CDR. Overall, this research extends institutional theory to the digital realm, offering valuable insights into CDR-related corporate behavior and strategy. It emphasizes that competitor awareness and professional norms, rather than customer pressure, are the key drivers for managing digital risks effectively.

Keywords: Digital Transformation, Digitalization, Corporate Digital Responsibility, CDR, Institutional theory

Statements and Declarations: The data used in this study were collected in a survey conducted for the periodical magazine “Stern” (Gronwald, S., Wolf-Doettinchem, L., 2019. Unternehmen Zukunft. Stern 34/2019, 95–102). The authors did not receive any financial compensation and the study was conducted independently.

JEL Classification: D23, M14, M15, O33

1 Introduction

The digital transformation is increasingly impacting every aspect of our lives with the continuous development and advancement of technologies such as cloud computing, robotics or artificial intelligence, creating, sharing and processing tremendous amounts of “big” data. As a result, innovative ways to enhance future profitability for companies emerge. However, recent years have also highlighted the potential negative impacts associated with the application of digital technologies as well as data collection and utilization, whether it be data breaches or discrimination by artificial intelligence. To systematically address these risks, (supra-) national regulations (e.g., AI-Act or GDPR) as well as societal pressures demand their integration in risk management and governance processes. While mandatory policies often define but minimum standards, companies can voluntarily take responsibility beyond legal requirements, e.g., to gain competitive advantages. Given the rapid dissemination, malleability, ubiquity and pervasiveness of digital technologies, we argue in line with Lobschat *et al.* (2021), Mihale-Wilson *et al.* (2022) and Carl *et al.* (2024) that the concerns related to digital transformation need to be explicitly addressed as Corporate Digital Responsibility (CDR) in addition to the well-established concept of Corporate Social Responsibility (CSR).

CDR is thus understood as a cross-sectional field of CSR that focuses on the effects of the digital transformation, specifically the creation and operation of digital technologies and data (Lobschat *et al.*, 2021). More precisely, we define CDR as an organizational practice, comprising voluntary corporate strategies and measures to identify, mitigate and prevent negative societal impacts of the creation and operation of digital technologies and data as well as to leverage them to further support societal concerns.

In a related vein to risk management theory (Kaplan and Mikes, 2012), the implementation of CDR can be organized along three different categories: compliance, operational, and strategic CDR. At the compliance level, CDR aligns with risk management and aims at reducing negative impacts on a company’s stakeholders or society at large (first-level CDR). The second level extends CDR to operational measures that enable companies to address stakeholders’ or societal concerns within the existing operational business model by using digital technologies (second-level CDR). Finally, at the strategic level, CDR is extended to a core aspect of a firm’s responsibility within its business model, integrating

it comprehensively into its structures and processes (third-level CDR). While CDR – similar to CSR – is not solely altruistic, it can be turned into a business case by providing comparative competitive advantages (e.g., Saeidi *et al.*, 2015), enhancing customer trust and loyalty (e.g., Martínez and Rodríguez Del Bosque, 2013), motivating employees (e.g., Barakat *et al.*, 2016), and yielding other benefits identified in the CSR literature. Despite the prevalence of digital technologies, there is but limited research on digital responsibility issues (e.g., Lobschat *et al.*, 2021; Mihale-Wilson *et al.*, 2022; Carl *et al.*, 2024). This paper aims to address this gap by providing insights into mechanisms through which companies take up regulations and expectations regarding digital compliance (first-level CDR) as an antecedent and crucial aspect of digital responsibility. We define digital compliance as the adherence to laws, regulations, and guidelines related to data protection, data security, and other digital responsibility issues. This encompasses mandatory legal requirements as well as basic voluntary measures adopted by companies to ensure responsible digital practices. Focusing on extrinsic motivations such as social pressure and other external influences, the study uses institutional theory as a theoretical framework. By systematically deducing key drivers of corporate social behavior and understanding the underlying mechanisms using survey data, this research intends to support managers in effectively responding to their changing environment and formulating appropriate strategies. To illustrate these mechanisms, the study examines data security and data protection, which are widely emphasized areas of digital compliance (Carl *et al.*, 2024; Schoenheit *et al.*, 2019, pp. 13, 46–47).

In addition to exploring the institutionalization of digital compliance, this paper also explores the moderating effects of organizational agility on the implementation of digital compliance. This supplementary analysis aims to uncover nuanced insights into how organizational agility, defined as an organization's capacity to adapt swiftly and effectively to external and internal changes (Teece *et al.*, 2016), influences the adoption of digital compliance.

The remainder of this article will proceed as follows. In Section 2, we present the theoretical framework to describe social organizational behavior, followed by Section 3 in which we explore potential drivers of digital compliance using institutional theory and derive our hypotheses. We then describe our methodological approach in Section 4. The results of our hypothesis testing are presented in Section 5, Section 6 provides an insight

into the supplementary aspect of organizational agility. In Section 7, we discuss the findings acquired and finally, in Section 8, conclude our study.

2 Theoretical Framework

Data security and data protection are critical pillars of CDR for both businesses and consumers (Carl *et al.*, 2024). Unlike many other dimensions of CDR, these aspects are explicitly mandated by (supra-) national law in most developed countries (Lobschat *et al.*, 2021), making them classic compliance issues (Carl *et al.*, 2024). However, within the broader context of CDR and corporate responsibility in general, voluntariness plays a crucial role, as emphasized by the prevailing view in the CSR literature (see meta-analyses, e.g., Sarkar and Searcy, 2016; Dahlsrud, 2008). Viewed through the lens of corporate responsibility, companies have the opportunity to voluntarily exceed these legal and regulatory requirements, aiming to securing strategic advantages (Carl *et al.*, 2024). There are various theories with different perspectives on why and how organizations voluntarily engage in social behavior. Legitimacy theory suggests that companies engage in social and environmental activities to gain and maintain legitimacy in society as a whole (e.g., Dowling and Pfeffer, 1975; Suchman, 1995). However, it lacks specificity in identifying concrete drivers of social behavior (Parker, 2005). Stakeholder theory, on the other hand, considers individual stakeholders, their expectations, and their relationships with an organization (Freeman, 1984). While these strategic or managerial approaches provide valuable insights into the instrumental use of various measures to gain societal support (Suchman, 1995), they also have limitations in fully describing or predicting organizational behavior.

Institutional theory complements both theories by also presupposing the pursuit of legitimacy (Scott, 2014, p. 75; Deegan, 2002) through the fulfillment of societal expectations but additionally describing how organizations respond to sector-wide social and institutional structuration dynamics that go beyond the direct control of individual organizations (Suchman, 1995). It provides a broader perspective on corporate responsibility, considering various institutional mechanisms that influence the relationship between organizations and society beyond mere stakeholder pressure (Babiak and Trendafilova, 2011; Campbell, 2007). Institutional theory attempts to further explain organizational change and the adoption of certain practices, processes, or structures by proposing several

mechanisms that increase the homogeneity of organizations (isomorphism), which ought to improve their fit with their environment (DiMaggio and Powell, 1983; Bondy *et al.*, 2012). According to DiMaggio and Powell (1983), these mechanisms can be classified as coercive, mimetic, and normative forces.

Previous research has addressed institutional influences related to disclosures about data security and data protection (e.g., D'Arcy *et al.*, 2022; Jeyaraj and Zadeh, 2020), but not the implementation itself. In general CSR research, scholars have examined how these forces impact the implementation of CSR practices directly (e.g., Bondy *et al.*, 2012; Jamali and Neville, 2011; Ozdora-Aksak and Atakan-Duman, 2016; Perez-Batres *et al.*, 2010), yet their findings vary, likely due to the broad interpretations and applications of CSR. By focusing specifically on data security and data protection, we aim to narrow this gap and investigate how institutional pressures affect the practical implementation of these critical aspects of CDR.

3 Hypothesis Development

Primary Stakeholders and Coercive Pressure

Coercive isomorphism is the first explanation of organizational change according to institutional theory. This process is induced by pressure exerted by stakeholders on whom an organization depends, which coerce the organization to comply with these stakeholders' expectations to reduce the risk of losing legitimacy (DiMaggio and Powell, 1983). This force includes the capability of stakeholders to impose sanctions on organizations to influence future behavior through formal (e.g., legal trials) or informal (e.g., boycotts) processes (Scott, 2014, pp. 59–60).

In consideration of the current state of the digital transformation, where companies progressively implement digital technologies in their processes and products while customer data is becoming an increasingly integral part thereof, we argue that customers are one of the most affected stakeholders with respect to digital compliance and should therefore be given particular attention. In this paper we will thus focus on pressure exerted by customers, while stressing that possible impacts of other important stakeholders (e.g., employees, suppliers) should be investigated in future research.

Customers generally can exert much pressure, posing a direct economic threat tied to the potential loss of the social license if the company fails to meet their expectations (Gunningham *et al.*, 2004; Lynch-Wood *et al.*, 2009). However, it is not sufficient to regard customer power in isolation, since it goes hand in hand with customer interest, i.e., the willingness to use their power (Lynch-Wood *et al.*, 2009). In 2019, Schoenheit *et al.* (2019) conducted a representative survey about CDR-related issues from the consumers' point of view for the German Advisory Council for Consumer Affairs. The survey provided evidence that consumers set a high value especially on data security as well as protection and that they primarily hold companies responsible for it (Schoenheit *et al.*, 2019, pp. 13, 46–47). Consequently, those factors also influence whether a company stands out in a positive or negative manner with respect to digital responsibility (Schoenheit *et al.*, 2019, pp. 26, 40). Still, the study further revealed that a positive perception of digital compliance, on average, does not necessarily translate to a greater willingness to pay. Conversely, the absence of digital compliance significantly heightens the likelihood of losing customers (Schoenheit *et al.*, 2019, pp. 35–36, 41). This indicates that digital compliance is perceived as a must-be requirement according to Kano's (Kano *et al.*, 1984) model of customer satisfaction (Matzler *et al.*, 1996). These must-be requirements lead to dissatisfaction when they are not met, but only to “a state of not dissatisfied” when they are fulfilled (Matzler *et al.*, 1996; Carl *et al.*, 2024). A similar mechanism is also described by the expectation-disconfirmation theory (Oliver, 1980). This would imply that customers take digital compliance for granted and consequently do not directly express their respective expectations (Matzler *et al.*, 1996). Even though meeting these requirements is crucial for a firm's competitiveness (Matzler *et al.*, 1996), it is not directly communicated by the customers themselves.

We thus propose that there is no link between digital compliance and coercive pressure exerted by customers. Since we cannot directly measure coercive pressure, we instead consider the intensity of companies' exchange with customers, which ought to be how coercive pressure should be imposed on those companies. We therefore hypothesize:

H₁: The intensity of a company's exchange with customers does not promote its digital compliance.

Copy and Paste Legitimacy: Mimetic Forces

The second mechanism used to describe the institutional adaption of corporate structures and practices according to institutional theory are mimetic forces. Essentially, mimetic isomorphism describes that companies imitate their competitors as a response to uncertainty regarding their own legitimacy (DiMaggio and Powell, 1983; Suchman, 1995). This uncertainty can arise from technological or business change (Jeyaraj and Zadeh, 2020; Matten and Moon, 2008), changes in customer expectations as well as unclear or lacking government regulation (Bondy *et al.*, 2012). When mimicking their competitors' behavior – which they perceive as legitimate and successful (DiMaggio and Powell, 1983; Matten and Moon, 2008) and thus “proven and tested” – companies can reduce their risk of losing legitimacy (Unerman and Bennett, 2004) by not attracting negative attention for deviating.

In the context of digital compliance – and the digital transformation in general – many companies are faced with uncertainty (Warner and Wäger, 2019). The vast malleability of digital technologies and data not only raises questions regarding the numerous opportunities but also the downsides and risks (Lobschat *et al.*, 2021), which are often neither completely grasped nor considered, since in most cases there are no concrete regulations or guidelines. The issues around data protection and security are broadly known and have been publicly discussed for decades now. For this reason, there already are (supra-) national legal regulations addressing the collection and use of data – like the GDPR of the EU. Such laws provide guidelines and therefore ought to reduce uncertainties regarding legitimate behavior (Bondy *et al.*, 2012). Since policies often merely define minimum standards and leave areas of discretion, companies still have opportunities to engage in data protection and security beyond legal requirements, which will likely grant them competitive advantages. Furthermore, the enormous progress of AI applications introduces numerous factors that contribute to uncertainty such as their malleability, complexity, and opacity. We argue that these factors encourage companies to closely monitor their competitors and engage in imitative actions. We thus hypothesize:

***H₂:** The greater a company's knowledge about its competitors, the higher is its engagement in digital compliance.*

Professional Values and Norms: Normative Influences

The third explanation of organizational change proposed by institutional theory are normative forces, presuming that organizations (or members thereof) are influenced by normative systems (Larrinaga-González, 2007, p. 157). These normative systems consist of both desirable objectives – values – as well as the appropriate ways to aim for them – norms (Scott, 2014, p. 64). In contrast to coercive forces, where self-interest plays a superior role, normative systems induce a certain behavior by routines and beliefs, so they do not necessarily align with financial objectives (Larrinaga-González, 2007, p. 157).

DiMaggio and Powell (1983) refer to the process of incorporating normative systems as professionalization. According to their definition, it results from members of a profession collectively striving to define the conditions and methods of their work, bring forth skilled professionals, and establish a cognitive framework for their professional autonomy (DiMaggio and Powell, 1983).

There are several ways by which organizations adapt similar normative systems and thus practices through professionalization: Formal (e.g., university) education and professional networks and associations that can spread methods, best practices, etc. via external normative discourses (DiMaggio and Powell, 1983; Suchman, 1995).

With respect to digital compliance these mechanisms are likely to apply as well. Some aspects can already be found in normative systems distributed by international professional associations such as the Institute of Electrical and Electronic Engineers, which provides a code of conduct for software engineers as well as standards and guidelines for data security (Lobschat *et al.*, 2021). Since theory and practice are progressively developing awareness of the relevance of digital compliance, it is increasingly reflected in topics addressed in professional trainings, conventions, trade magazines etc. We hence argue that if a company engages in these professional exchanges, it is more likely to adopt the respective normative systems. We thus hypothesize:

H₃: The greater a company's professional information input, the more it engages in digital compliance.

4 Research Design

The data used in the analysis was obtained from an existing dataset from a survey conducted in 2018 that examined several drivers of economic sustainability, including digital transformation, market position and customer knowledge. The survey focused on the company as a whole and did not include respondent characteristics. Overall, the dataset consists of 162 German companies, with a majority (71.6%) being large (more than 500 employees). Sample characteristics can be found in the Appendix B-I.

Most survey items were measured using a six-point Likert scale, indicating respondents' agreement levels ranging from "strongly disagree" to "strongly agree". A six-point scale eliminates the midpoint, forcing respondents to make a more definitive choice, which can lead to more accurate reflections and higher data quality in some contexts (Weijters *et al.*, 2010). Research indicates that scales without a neutral option mitigate central tendency bias, where respondents might otherwise default to the convenient midpoint instead of further reflecting (Chyung *et al.*, 2017; Velez and Ashworth, 2007). However, the absence of a midpoint might introduce biases if it aligns with the participant's genuine response, e.g., ambivalence (e.g., Garland, 1991; Weijters *et al.*, 2010). In our context, employing scales typically ranging from "strongly disagree" to "strongly agree" to assess organizational practices (opposed to, e.g., personal opinions), a midpoint interpreted as "neither disagree nor agree" would not be meaningful. Thus, we conclude that the potential data quality improvement justifies the exclusion of a midpoint. Unless stated otherwise, the items used in this study were scaled accordingly and have been standardized for the analysis. The constructs and items used can be found in the Appendices B-II–B-IV.

Dependent Variable

The variable to be explained by our models is digital compliance. We operationalized the construct through three items capturing different aspects of data security and data protection. Investment in data security assesses the extent to which a company allocates resources to ensure data security, reflecting financial commitment to digital compliance. The number of measures to ensure data protection indicates operational efforts aimed at protecting data, and systematic training provided to employees on data protection and security highlights organizational efforts to foster a culture of compliance (Cram *et al.*, 2017; Puhakainen and Siponen, 2010). Since these indicators address different aspects of digital compliance and are not interchangeable, we treated the construct as formative

(Diamantopoulos and Winklhofer, 2001), allowing us to add the items up. Additional statistical analyses reinforce the assumption of a formative nature of the construct (Cronbach's alpha: 0.58; average interitem correlation: 0.31). Descriptive statistics for these items can be found in Table B-1.

Table B-1: Descriptive Statistics of the Items used for the Dependent Variable

	Min.	Max.	Mean	SD
Digital Compliance	-3.31	1.29	0	1
Investment in Data Security	1	6	5.09	1.08
No. of Measures used for Data Protection	1	8	5.65	1.62
Employee Trainings on Data Protection and Security (0 = no, 1 = yes)	0	1	0.78	0.42

Min.: minimum, Max.: maximum, SD: standard deviation.

Independent Variables

To measure the coercive forces directly exerted by customers (H_1), we used a single item that describes the extent to which a company engages in an intensive and regular exchange with customers. This item shows a high correlation with the related item “We are very close to our customers; we know their wishes and expectations.” ($r = 0.83$). Knowing the wishes and expectations of customers comes partly from an exchange with them. It can thus be assumed that the exchange with customers, as queried by our item, is a channel through which customers communicate their wishes and expectations (e.g., data protection and security). Accordingly, this interaction could allow customers to exert pressure. Since the specific channel is not determined in the related item, the information could also come from professional sources such as conferences, which would relate to normative forces. Therefore, we have decided not to include this variable in the analysis. Instead, we believe that the single item provides a reliable measurement for coercive forces. This is further emphasized by the item's understandability. Thus, it meets the theoretical requirements for a reliable single item (Bergkvist and Rossiter, 2007).

To investigate mimetic forces (H_2), we considered companies' knowledge about their competitors through various means such as trade journals, internet research, trade fairs,

and congresses. We used respondents' information on the number of channels and measures they use to collect competitor information systematically. Although this variable does not indicate the intensity or efficiency of information collection, we argue that a greater variety of channels used leads to more information input and greater knowledge about competitors. We also included participants' agreement to the statement about extensive knowledge about their strongest competitor to capture the extent to which companies handle information about successful competitors in their competitive environment. Overall, both items depict ways in which companies obtain information about competitors that they can eventually use to imitate them. These two variables contribute to the construct on different levels. It was thus treated as a formative construct and the items were combined into an additive score, further supported by both items being weakly correlated ($r = 0.46$; Bollen and Lennox, 1991).

To measure normative forces (H_3) we considered the collection of customer information through professional sources (e.g., congresses, trade fairs and magazines) – opposed to direct communication with customers – as a potential explanation for normative isomorphism (DiMaggio and Powell, 1983; Kauppi and Luzzini, 2022). We used a variable indicating the number of professional channels and measures used by companies to obtain customer information. Additionally, we examined whether norms and values related to digital compliance are systematically conveyed when dealing with digital and technological trends through these channels, so we included a count variable representing the number of channels used to gain such information. Both variables cover the acquisition of information through professional channels that enable the professionalization and adoption of digital compliance. The standardized variables were combined to form the construct, as they cover different aspects.

Table B-2 provides descriptive insights into the used items.

Control Variables

Given the necessity of digitization for digital compliance, we assume that it plays a significant role in explaining digital compliance. We therefore included the stated digitization level in various areas, i.e., human resources, administration, development, purchasing, production, marketing, and sales. These areas are distinct and not interchangeable, so we presume a formative construct (Bollen and Lennox, 1991) and have therefore added the individual items.

Table B-2: Descriptive Statistics of the Items used for the Independent Variables

	Min.	Max.	Mean	SD
Exchange with Customers	-3.90	0.82	0	1
Knowledge About Competitors	-3.44	1.66	0	1
No. of channels used to collect information about competitors	0	6	3.50	1.42
Knowledge about strongest competitor	1	6	4.80	1.11
Professional Information Input	-2.97	1.47	0	1
No. of channels used to collect information about customers	0	7	3.80	1.89
No. of channels used to collect Information about digital trends	0	7	5.00	4.26

Min.: minimum, Max.: maximum, SD: standard deviation.

Another factor influencing digital compliance is CSR engagement. We propose that companies with a strong CSR focus also tend to have the necessary societal awareness, structures, and processes that indirectly support digital compliance. Similar to Feder and Weißenberger (2019), we measured CSR engagement across public welfare, environment, market, and workplace, considering how committed companies are to these areas beyond their core business activities. Like other researchers, we view CSR as a formative construct comprising these different aspects (e.g., Feder and Weißenberger, 2019; Gjølborg, 2009; Martínez and Rodríguez Del Bosque, 2013), so we were able to build the construct by adding the items.

To account for other influences, we controlled for company size, measured by the number of employees, presuming that larger companies often face stricter regulations and higher societal expectations (Lynch-Wood *et al.*, 2009). Different industries may also exhibit varying digital compliance due to industry-specific development and distribution of normative systems as well as expectations and respective pressure (Ozdora-Aksak and Atakan-Duman, 2016). Additionally, we included the average age of employees as a control variable, recognizing that, e.g., older employees may have lower technology-related comprehension. Table B-3 provides descriptive statistics for these control variables.

Table B-3: Descriptive Statistics of the Control Variables

	No. of Items	Min.	Max.	Mean	SD
Level of Digitization	7	10	42	28.93	6.46
Level of CSR Engagement	4	4	24	17.61	4.39
Age of Employees	1	28	50	40.39	4.26

Min.: minimum, Max.: maximum, SD: standard deviation. Firm Size and Industry are not tabulated, since they are already included in Appendix B-I.

5 Analysis and Results of Hypotheses Testing

To statistically test the developed hypotheses, we performed ordinary least squares (OLS) regressions for two models: Model 1 examines the effects of the explanatory variables (i.e., exchange with customers, knowledge about competitors and professional information input) on digital compliance while excluding the control variables, whereas Model 2 further incorporates them. The results of the regression analysis of both models are shown in Table B-4.

The results of Model 1 show that the included variables explain 18.9% of the variance of digital compliance. Only professional information input has a statistically significant (positive) effect, likely biased due to its inclusion of information on digital technology, which indirectly contributes to higher digitization and thus endogeneity (Hamilton and Nickerson, 2003). The results of Model 2 further indicate this: After controlling for these effects, the influence of professional information input on digital compliance remains significant, but decreases by approximately half in magnitude, while digitization exhibits a highly significant positive effect. The inclusion of control variables has also caused knowledge about competitors to become statistically significant. Control variables are included to account for confounding factors that might bias the true relationship between the dependent and independent variables. Without these controls, the effect of knowledge of competitors is likely masked. By including control variables such as digitization and CSR engagement, we absorbed these influences, reducing omitted variable bias and thus endogeneity (Wooldridge, 2016, pp. 78–81). This revealed a more precise estimate for the effect of competitor knowledge on digital compliance. The effect from the exchange

Table B-4: Results of Hypotheses Testing

	Model 1	Model 2
Coercive Forces		
Exchange with Customers	- 0.021	- 0.099
Mimetic Forces		
Knowledge about Competitors	0.102	0.242*
Normative Forces		
Professional Information Input	0.388***	0.180*
Control Variables		
Level of Digitization		0.312***
Level of CSR Engagement		0.080
Firm Size		0.248**
Age of Employees		- 0.006
<i>N</i>	162	152
<i>R</i> ²	0.2040	0.5289
<i>R</i> ² _{adjusted}	0.1890	0.4317

Table B-4 shows the results obtained by OLS regression with digital compliance as dependent variable. The entries represent the standardized coefficients (β), and the respective statistical significance is indicated by * for $p < .05$, ** for $p < .01$ and *** for $p < .001$. For better readability the table does not contain the dummy variables used to control for the industry; they still have been considered in Model 2. Intercept is 0 for both models, since all variables have been standardized.

with customers remains statistically indistinguishable from zero. Among the remaining control variables only company size exhibits a significant (positive) influence on digital compliance, while the average age of employees does not. The industry (not tabulated) adds 13 percentage points to the explained variance of digital compliance, likely due to exposure and visibility differences and industry-specific norms. Additionally, CSR activities do not significantly promote digital compliance. Overall, including these control variables has more than doubled the adjusted R^2 to 0.4317.

After having standardized all independent variables, the generalized variance inflation factors (VIFs) were below 2 for all predictors, which indicates that multicollinearity is likely not an issue.

The regression analysis therefore provides support for all three hypotheses H_1 , H_2 and H_3 .

6 Supplemental Analysis: The Moderating Effect of Organizational Agility

6.1 Theoretical Background of Organizational Agility

So far, our investigation has mainly considered different information input and ignored possible factors influencing the processes from the information input to digital compliance. Given the dynamic nature of the digital transformation and societal expectations, it is necessary for companies to have structures and processes that enable them to adapt quickly and flexibly. We therefore propose organizational agility as a moderator of isomorphism to better understand the link between isomorphic forces and the actual realization of digital compliance.

Teece *et al.* (2016) describe organizational agility as an organization's ability to efficiently and effectively reallocate its resources towards value-enhancing activities in response to internal and external circumstances. This agility requires so-called dynamic capabilities, which are crucial for adapting to the changing environment and actively shaping it as well (Teece *et al.*, 2016). Teece (2007) categorizes these capabilities as sensing and shaping opportunities and threats, seizing opportunities, and transforming assets (Warner and Wäger, 2019).

Given the disruptive impact of digital transformation on organizations and their environments, the importance of dynamic capabilities is evident (Vial, 2019). This is particularly applicable in uncertain settings, where there is no specific risk that can be mitigated (Teece *et al.*, 2016). Uncertainty not only arises from emerging digital trends and resulting complex value networks regarding customer demands (Vial, 2019), but also from the respective digital responsibility.

6.2 Measures of Dynamic Capabilities

We employed several items to describe organizational agility. Similar to Ramachandran (2011), who investigated the influence of dynamic capabilities on CSR practices, we combine sensing and seizing capabilities and further consider transformation capabilities proposed by Teece (2007). Accordingly, the former capabilities involve perceiving social conditions, identifying and addressing social issues, and designing responses to mitigate

them, whereas the latter describe leveraging internal and external resources to implement the designed responses and build the required infrastructure (Ramachandran, 2011).

Exploratory factor analysis affirmed the existence of only two distinct constructs identified as sensing/seizing as well as transformation capabilities. Sensing and seizing capabilities are represented by items assessing companies' engagement with and preparedness for external developments and challenges, while transformation capabilities are depicted by items related to internal processes and resource allocation. The specific items used in the study can be found in Appendices B-V. We argue that both agility constructs are reflective because the latent variables are likely to influence all the indicators included within each construct.

The statistical analysis reveals satisfactory internal consistency for both constructs (Cronbach's alpha: 0.844 for sensing/seizing capability and 0.758 for transformation capability). We therefore computed the respective variables for sensing/seizing and transformation capability by using the regression-based factor scores obtained from factor analysis.

6.3 Analysis and Results

To analyze the moderation effects, we have extended the models presented above by introducing interaction terms of the two aspects of agility and the respective predictors exchange with customers, knowledge about competitors and professional information input. As in the previous models, we performed an OLS regression for the statistical analysis of the effects, the results of which are shown in Table B-5.

The regression results show that organizational agility plays a significant moderating role only in the relationship between knowledge about competitors and digital compliance. Notably, two opposing moderating effects show: while sensing/seizing capability positively influences the effect, transformation capability negatively moderates it.

Including the interaction terms also has impacts on the main effects and their interpretation. When investigating moderation effects, the main effect represents the influence of the predictor variable on the dependent variable in the case of the moderator variable taking the value "0" (Wooldridge, 2016, p. 178). To reduce multicollinearity, all predictors, including the moderators, were standardized (and thus centered). Therefore, the value "0" of these standardized variables corresponds to the mean of the original

Table B-5: Regression Results of the Moderating Effect of Organizational Agility

Coercive Forces	
Exchange with Customers	-0.030
X Sensing/Seizing	0.100
X Transformation	0.037
Mimetic Forces	
Knowledge about Competitors	0.344**
X Sensing/Seizing	0.270*
X Transformation	-0.283*
Normative Forces	
Professional Information Input	0.045
X Sensing/Seizing	-0.217
X Transformation	0.024
Control Variables	
Level of Digitization	0.287***
Level of CSR Engagement	0.086
Firm Size	0.221**
Age of Employees	0.011
$N = 151, R^2 = 0.5801, R^2_{adjusted} = 0.4581$	

Table B-5 shows the results obtained by OLS regression with digital compliance as dependent variable including organizational agility as moderating factor. The entries represent the standardized coefficients (β), and the respective statistical significance is indicated by * for $p < .05$, ** for $p < .01$ and *** for $p < .001$. For better readability the table does not contain the dummy variables used to control for the industry; they still have been considered.

variables. Consequently, the coefficient regarding the main effect describes the effect of the predictor on the dependent variable when the dynamic capabilities are at their average values (Wooldridge, 2016, p. 178). We can therefore deduce that for average dynamic capabilities only the effect of knowledge about competitors remains significant.

We again looked at the generalized VIFs of the included variables to ensure that multicollinearity is not an issue. Only two interaction terms slightly exceeded a generalized VIF of 2, which is generally not problematic, since they generate multicollinearity by definition (Jaccard and Turrissi, 2003, pp. 27-28).

7 Discussion

7.1 Academic and Practical Implications

Our study contributes to the academic discourse by extending institutional theory to the realm of digital compliance, offering new insights into how coercive, mimetic, and normative forces shape corporate behavior in the digital age. By analyzing the conditions under which companies engage in digital compliance, our research sheds light on institutional drivers that influence this fundamental aspect of CDR and contributes to the broader literature on CSR with a digital focus. It does not only show that the framework proposed by institutional theory is applicable to digital compliance, but it also finds some concrete drivers that allow important theoretical and practical implications to be derived. As expected, customer pressure was not found to drive digital compliance, possibly because customers do not directly express their expectations. The results of our hypothesis testing show no significant effect of exchange with customers on digital compliance, supporting our hypothesis. However, it is important to stress that the absence of evidence is not evidence of absence (Altman and Bland, 1995). So, we cannot conclusively reject nor confirm the hypothesis. Nevertheless, this finding aligns with the literature on customer satisfaction and the CDR-related survey conducted by Schoenheit *et al.* (2019), which indicates that customers highly value CDR, particularly data protection and security, but take it for granted and are thus unwilling to pay more for it (Schoenheit *et al.*, 2019, pp. 35–36). It can be deduced from Kano’s model of customer satisfaction (Kano *et al.*, 1984) that their expectations are also not specifically directed towards the company (Matzler *et al.*, 1996) and coercive pressure is not strongly exerted, according to institutional theory. To meet customer expectations and mitigate related risks, companies should proactively address compliance issues. However, it is questionable whether this applies to all levels of CDR. Although Schoenheit *et al.* (2019) covered digital responsibility in general, we strongly suspect that compliance-related concerns such as data protection and data security are considered must-be requirements, while other more recent and less-known aspects are not. Practical examples suggest that certain requirements transition from being attractive (not expected and not communicated; Matzler *et al.*, 1996) to becoming must-be requirements over time, as customers increasingly take them for granted (Min *et al.*, 2018).

This must be considered when transferring the results of our study to other dimensions of CDR.

In contrast to that, adapting to competitors' behavior strongly drives digital compliance. Our regression analysis showed that a company's knowledge about competitors exhibits the strongest effect on digital compliance among the central variables considered. This effect remained significant even when interaction terms were included, i.e., for average values of agile capabilities. This suggests that mimetic forces, in line with CSR literature (e.g., Bondy *et al.*, 2012; Ozdora-Aksak and Atakan-Duman, 2016; Perez-Batres *et al.*, 2010), influence the engagement in digital compliance, further supporting our assumption that digital responsibility and its underlying technologies lead to high uncertainty. This knowledge can be used on the part of the government, non-governmental organizations and standard setters to provide clarification and guidelines on the opportunities and risks of digital technologies. Though, these adaptations also indicate that industry standards have been developing and are likely to become more established if proven to be appropriate. Managers should recognize that addressing institutional pressures can reduce or even prevent legal regulations that result from a lack of voluntary responsibility (Nikolaeva and Bicho, 2011). These mandatory regulations are often stricter and can lead to competitive disadvantages by reducing regulatory flexibility (Gunningham *et al.*, 2004) as well as adaptiveness to specific organizational properties and hindering innovative practices (Lynch-Wood *et al.*, 2009).

A third conclusion is that the professionalization of digital compliance leads companies to adopt normative systems, which in turn promotes digital compliance itself. While some authors have found normative isomorphism regarding CSR among companies (e.g., Ozdora-Aksak and Atakan-Duman, 2016), other studies did not (e.g., Jamali and Neville, 2011; Bondy *et al.*, 2012). We argue that one reason for this could be that digital compliance is less company-specific than CSR, particularly in data protection and data security, as underlying values and practices are directly linked to the digital technologies themselves and do not necessarily differ much between companies. Consequently, the distribution and adoption of respective normative systems should be facilitated. Of course, the effect cannot be attributed solely to moral considerations. We believe that especially higher-level CDR also positively influences a company's financial performance, making it a lucrative part of their business cases. Therefore, investigating the impact of CDR on

corporate financial performance is crucial for understanding corporate behavior and deriving practical recommendations. Like CSR, managers are more likely to implement CDR practices for strategic reasons if a positive link between CDR and financial performance is proven (Orlitzky *et al.*, 2003; Hillman and Keim, 2001).

After considering agile capabilities, we only found a significant moderating influence on the relationship between knowledge about competitors and digital compliance. In line with the theory presented, sensing/seizing capability positively affects digital compliance as companies that efficiently select and assess information are more likely to digitally comply after observing competitors. However, our initial assumption that transformation capability would amplify the effect of competitor knowledge on digital compliance is contradicted by a negative effect. Companies with low transformation capabilities might rely more on efficient risk management as they are less able to react quickly and flexibly to sudden changes or events. They gain the required awareness by observing their competitors, which leads them to engage more in digital compliance. In contrast, companies with high transformation capability gain certainty by observing competitors but rely on their flexibility to address identified risks instead of investing in digital compliance. After all, corporate behavior is a consequence of complex trade-offs: While establishing a risk management system is often less costly and more efficient than developing and maintaining flexibility (Teece *et al.*, 2016), being agile brings advantages in specific situations. Companies can then, e.g., concentrate on other more value-creating activities based on data instead of data protection, which will likely restrict their actions.

While we do not encourage such behavior, (short-term) economic motivations cannot be disregarded. Still, anticipating risks rather than reacting is strategically important, as problem-solving becomes less efficient and effective after an event has occurred (Gunningham *et al.*, 2004). Companies will prioritize reaction over prevention if the costs of adjustments and negative externalities are low, which might be more likely with digital technologies (e.g., software) (Teece *et al.*, 2016).

However, the question arises why these mechanisms do not seem to work with other isomorphic forces. Regarding the exchange with customers, it can be intuitively explained since there was no significant effect on digital compliance to begin with. However, when it comes to professional information input, comparing it to knowledge about competitors helps to understand the missing moderation effect. The adoption of best practices

regarding data security and protection, defined by professional networks and associations in the form of, e.g., standards and guidelines (Lobschat *et al.*, 2021), are likely driven by the necessity to avoid competitive disadvantages and meet baseline compliance requirements (Bondy *et al.*, 2012). This necessity would apply across organizations regardless of their agility. The activities observed among competitors likely extend beyond these basic requirements when competitive advantages are pursued. An additional argument for this explanatory approach is that baseline requirements and related risks, once professionalized, are well-known and thus less uncertain, making agility less significant in this context (Teece *et al.*, 2016). Teece *et al.* (2016) argue that capabilities for risk avoidance differ from those for seizing opportunities, making agile capabilities context sensitive. Consequently, companies may not effectively utilize their dynamic capabilities to seize opportunities in relation to digital compliance.

These observations suggest that managerial motivations outweigh ethical motivations, which is indicated by agile companies engaging less in preventive measures related to competitive disadvantages but instead rely on their flexibility. On the other hand, agile capabilities that improve the efficiency and effectiveness in identifying and anticipating societal challenges promote the adaptation to the company's environment.

7.2 Limitations and Future Research

Nonetheless, there are several limitations that must be considered. A major limitation stems from the measurement of our independent variables. For each of the three isomorphic forces, we examined channels through which these forces were expected to operate (exchange with customers, knowledge about competitors, and professional information input). While these provide interesting insights, we did not measure the forces themselves, such as the exertion of pressure, the imitation of competitors, or the aspiration to conform to norms. Although we argue that the use of these channels can serve as proxies for the forces, we recognize that this cannot be equated with direct measurement. Future research could undertake a more nuanced distinction of these effects. The second major limitation relates to the interpretation of the results concerning Hypothesis 1. As hypothesized, we did not find a significant effect of coercive pressure. However, the absence of evidence is not evidence of absence, meaning that our hypothesis cannot be conclusively confirmed or refuted based solely on this study. Additionally, it is important to stress that digital responsibility extends beyond digital compliance, and our findings likely do not

extend to higher-level CDR and issues that are less prominent and established. Future research has the potential to uncover potentially arising differences. Furthermore, future investigations could explore expectations and pressures from stakeholders beyond customers, which may present different dynamics and influences on digital compliance and responsibility. Finally, the study primarily focused on large German companies, which may limit the generalizability of the findings to other contexts or smaller enterprises. Further research is necessary to validate these findings across different organizational settings and cultures.

8 Conclusion

The digital transformation offers significant benefits for the economy and society but also carries risks that companies should consider. In this study, we focused on digital compliance as the foundation of CDR. Our aim was to examine how companies incorporate this facet of digital responsibility through institutionalization processes.

Institutional theory has laid the foundation that allowed us to show that digital compliance has been widely institutionalized, at least with respect to data protection and security. Companies adopt the underlying norms and values through professionalization and imitate practices of their competitors. Digital compliance is seen as desirable, likely due to reasons such as avoiding competitive disadvantages, reducing uncertainty, gaining legitimacy, but likely also ethical considerations. However, customers do not seem to directly exert pressure regarding digital compliance, likely because these aspects are now taken for granted and therefore not explicitly demanded.

In summary, the findings of this study provide valuable insights into the institutionalization of digital compliance that can assist managers in developing a deeper understanding of the underlying mechanisms and incorporating them into their strategic decision-making regarding the opportunities and constraints associated with digital compliance as well as shape the institutional framework to their advantage. Furthermore, this study contributes to the existing body of literature by providing insights into the relatively unexplored field of digital compliance in the context of CDR. These findings serve as a foundation for future research in this area, offering potential avenues for further exploration and advancement of the field.

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Appendices

Appendix B-I: Sample Characteristics

	Frequency	Percentage
Employees (full-time equivalent)		
< 500	46	28.4
500 – 1.999	52	32.1
2.000 - 10.000	45	27.8
> 10.000	19	11.7
Branches of Industry		
Art, Culture and Sports	1	0.6
Automobile and Vehicle Construction	10	6.2
Banking and Financial Services	6	3.7
Construction	8	4.9
Consulting	6	3.7
Consumer Goods and Trading	26	16
Education and Science	3	1.9
Energy, Water and Environment	10	6.2
Health Care and Social Affairs	12	7.4
Industry and Engineering	30	18.5
Insurance	3	1.9
Internet and Information Technology	11	6.8
Manufacturing	4	2.5
Marketing, PR and Design	1	0.6
Personnel Services	3	1.9
Pharma and Medical Technology	4	2.5
Public Sector, Associations and Institutes	3	1.9

(continued on next page)

	Frequency	Percentage
Branches of Industry		
Tourism and Gastronomy	5	3.1
Transportation and Logistics	6	3.7
Other	10	6.2

Appendix B-II: Survey Items (Dependent Variable)

Label	Item
Digital Compliance	
DC_A ^a	Our company invests a sufficient amount in data security.
DC_B ^b	What measures do you apply in your company that ensure the protection of your company data?
DC_B1	Password protection for all IT systems
DC_B2	Encryption of data
DC_B3	Regular check of the log files
DC_B4	Encrypted e-mail communication
DC_B5	Training on data security for managers
DC_B6	Further training on data security for IT specialists
DC_B7	Further training on data security for other employees
DC_B8	Others
DC_B9	We do not take any of these measures to protect our company data.
CDF_C ^b	On which digital topics do you offer regular, systematic training for your employees? (Data protection / security)

^a Six-point Likert scale; ^b Multiple choice

Appendix B-III: Survey Items (Independent Variables)

Label	Item
Exchange with Customers	
CF^a	We maintain an intensive and regular exchange with our customers.
Knowledge about Competitors	
MF_A^a	We have extensive knowledge about our strongest competitors.
MF_B^b	Which channels and measures do you use at least once a year to systematically collect information and data on your largest competitors?
MF_B1	Internet research
MF_B2	Publications, e.g. annual reports or press releases
MF_B3	Fairs
MF_B4	Congresses
MF_B5	External agency or consultant
MF_B6	Others
MF_B7	We do not systematically collect information and data on our largest competitors.

(continued on next page)

Label	Item
Professional Information Input	
NF_A^b	Which channels and measures do you use at least once a year to systematically collect information and data on your customer target groups?
NF_A1	Internet research
NF_A2	Publications, e.g. studies or press articles
NF_A3	Fairs
NF_A4	Congresses
NF_A5	External agency or consultant
NF_A6	Feedback platforms
NF_A7	Others
NF_A8	We do not systematically collect information and data on our customer target groups.
NF_B^b	Which channels and measures are used in your company to systematically collect information on new technical and digital trends and developments?
NF_B1	Internet research
NF_B2	Fairs / Congresses
NF_B3	Presentations
NF_B4	Trade publications, e.g. magazines, podcasts
NF_B5	Training courses and seminars
NF_B6	External agency or consulting
NF_B7	Others
NF_B8	We do not use any of the aforementioned channels and measures to systematically collect information on new technical and digital trends and developments.

^a Six-point Likert scale; ^b Multiple choice

Appendix B-IV: Survey Items (Control Variables)

Label	Item
Level of Digitization^a	
	Please evaluate the extent to which the digitization of processes in the following areas has already been pushed forward in your company.
DIG_1	HR / Personnel
DIG_2	Administration
DIG_3	Development
DIG_4	Purchasing
DIG_5	Production
DIG_6	Marketing
DIG_7	Sales
Level of CSR^a	
	How strongly is your company involved in the following areas well beyond your actual business and visible to the public?
CSR_1	Welfare (e.g. art / culture / education)
CSR_2	Environment (e.g. climate / animal protection)
CSR_3	Market (e.g. respect for human rights in supply chains)
CSR_4	Employees (e.g. health measures)
Firm Size (measured by number of employees; full-time equivalent)	
	< 500
	500 – 1.999
	2.000 - 10.000
	> 10.000

(continued on next page)

Label	Item
Age of Employees	
	What is the average age of the workforce in your company? (Age rounded to whole years)
Industry	
	Art, Culture and Sports
	Automobile and Vehicle Construction
	Banking and Financial Services
	Construction
	Consulting
	Consumer Goods and Trading
	Education and Science
	Energy, Water and Environment
	Health Care and Social Affairs
	Industry and Engineering
	Insurance
	Internet and Information Technology
	Manufacturing
	Marketing, PR and Design
	Personnel Services
	Pharma and Medical Technology
	Public Sector, Associations and Institutes
	Tourism and Gastronomy
	Transportation and Logistics
	Other

^a Six-point Likert scale

Appendix B-V: Survey Items (Organizational Agility)

Label	Item
Sensing/Seizing^a	
SE_1	Our company thoroughly deals with significant developments in the fields of politics, economy, society, technology, ecology and law.
SE_2	We are well prepared for the significant developments relevant to our company.
SE_3	We are able to adapt quickly to changes in the dynamic environment of our industry.
SE_4	Our managers are quick to adapt to new challenges, e.g. to adjustments in corporate strategy.
Transformation^a	
TR_1	Our internal processes run smoothly.
TR_2	Our employees are always provided with the resources and competencies to achieve corporate objectives.
TR_3	Our employees learn quickly.

^a Six-point Likert scale

C Next-Level CSR? Exploring the Comparative Impact of Corporate Digital Responsibility on Stakeholder Preferences

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Next-Level CSR? Exploring the Comparative Impact of Corporate Digital Responsibility on Stakeholder Preferences

Abstract

Digital transformation fundamentally changes how organizations create value and impact society, giving rise to Corporate Digital Responsibility (CDR) as a distinct dimension of corporate responsibility. This study explores whether digital responsibility initiatives shape stakeholder preferences differently compared to traditional Corporate Social Responsibility (CSR). Building on the theoretical foundations of signaling theory, social identity theory, and expectation-disconfirmation theory, we propose that CDR generates stronger stakeholder preferences than CSR due to unique characteristics of digital technologies. Additionally, we examine whether opportunity-based CDR (leveraging technology for societal benefit) outperforms risk-based CDR (mitigating digital harms). Through a vignette experiment with 150 participants evaluating scenarios as customers or prospective employees, we uncover unexpected results: when effectiveness is equal, stakeholders show no preference for CDR over CSR, with customers even significantly favoring traditional CSR initiatives. Furthermore, the distinction between opportunity-based and risk-based CDR does not influence preferences either. These findings suggest that stakeholders primarily evaluate responsibility initiatives based on their tangible outcomes rather than their technological sophistication. The study contributes to the emerging CDR literature by demonstrating that despite conceptual distinctions, stakeholders may not perceive digital responsibility as fundamentally different from traditional CSR in their behavioral responses. For practitioners, this implies that demonstrating the real-world impact of their actions should be prioritized over highlighting their digital mode.

Keywords: Corporate Digital Responsibility, Corporate Social Responsibility, Stakeholder Preferences, Digital Technologies, Signaling Theory, Social Identity Theory

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JEL Classification: M14, D91, D81, O33

1 Introduction

The success of the app “Too Good To Go” is built on a simple yet powerful digital business model: It connects consumers with restaurants and stores to sell surplus food at a reduced price, directly combating food waste. The company leverages a digital platform not just for profit but to solve a pressing societal problem, creating an inherently sustainable business. Since its launch in 2016, the platform has successfully prevented more than 300 million meals from being wasted, resulting in environmental benefits including the prevention of 810,000 tons of CO₂-equivalent emissions, conservation of 243 billion liters of water, and avoidance of 840 million m² in annual land use (B Lab Global, 2025). Simultaneously, it generates revenue through fees, provides partners with additional earnings on goods that would otherwise be discarded, and gives consumers more affordable access to quality food (Middlehurst, 2023). To further enhance its impact and partner operations, the company actively invests in technology, such as AI to help partners manage stock levels more efficiently (Middlehurst, 2023). This purpose-driven approach has enabled Too Good To Go to attract a broad base of users and partners, creating a powerful brand and a significant competitive advantage rooted in its societal mission (B Lab Global, 2025; Middlehurst, 2023).

This case shows that the strategic management of digital technologies has developed into a powerful element of corporate responsibility. Companies continuously develop and employ digital technologies to increase operational efficiency as well as gain strategic advantages. While digitalization undoubtedly offers countless such opportunities, it is also undeniable that it can have substantial negative social, ecological, and economic impacts, presenting companies with unprecedented challenges and responsibilities (Carl *et al.*, 2024; Herden *et al.*, 2021; Lobschat *et al.*, 2021; Mihale-Wilson *et al.*, 2022; Vial, 2019). As a result, there has been a growing need to specifically address the opportunities and risks associated with digital technologies within the realm of corporate responsibility. This need has led to the emergence of Corporate Digital Responsibility (CDR), a concept analogous to Corporate Social Responsibility (CSR) (Carl *et al.*, 2024; Lobschat *et al.*, 2021; Mihale-Wilson *et al.*, 2021). However, CDR is necessitated by core features of digital technology itself, specifically its pervasive nature, rapid evolutionary speed, and profound malleability (Lobschat *et al.*, 2021). These characteristics generate complex,

novel ethical dilemmas and risks, ranging from algorithmic bias to data privacy issues, which require focused consideration distinct from traditional CSR.

It is broadly recognized that corporate responsibility in general is more than just philanthropy; it represents a strategic business case aimed at harmonizing societal and financial objectives (Carroll and Shabana, 2010), as demonstrated by, e.g., Too Good To Go. From a behavioral perspective, this strategic approach relies on various mechanisms positively influencing different stakeholders' perceptions and behaviors – such as enhancing employee and customer satisfaction (e.g., Glavas and Kelley, 2014; Luo and Bhattacharya, 2006) – which can ultimately influence a company's attractiveness and thus competitive advantage and financial success. Recent research underscores this by showing that consumers highly value several activities related to digital responsibility (Carl *et al.*, 2024) and that CDR in general can enhance a firm's performance directly (Vo Thai *et al.*, 2024) or indirectly by significantly improving its reputation (Oduro *et al.*, 2024).

This raises critical questions for both research and practice: How do key stakeholders, such as customers and prospective employees, perceive and value these new forms of corporate responsibility? Does a company's engagement in CDR affect stakeholder preferences differently than its engagement in traditional CSR? This study addresses this gap by investigating whether the nature of a responsibility initiative – whether it is conventional CSR or digitally focused CDR – differentially impacts stakeholder preferences. Furthermore, we explore whether the orientation of CDR itself – as a proactive, opportunity-based initiative that leverages technology for social good, versus a defensive, risk-based initiative that mitigates digital harm – also leads to distinct evaluations.

To address these questions, we integrate three complementary theoretical lenses. Signaling theory (Spence, 1973) provides a framework for understanding how and why firms communicate their often-unobservable responsibility efforts to reduce information asymmetries. Social identity theory (Tajfel and Turner, 1986) then explains why stakeholders are drawn to organizations whose signaled values align with their own desire for a positive identity. Finally, expectation-disconfirmation theory (Oliver, 1977, 1980) helps to explain how the unique characteristics of digital technologies might moderate these preferences by either exceeding or falling short of stakeholders' pre-existing expectations.

To empirically examine this subject, we conducted a vignette-based experiment with 150 participants, who evaluated various scenarios in the role of either a customer or a

prospective employee. Our results challenge our initial assumptions about the appeal of digitalization. Contrary to our hypotheses, we find that stakeholder preferences are primarily driven by the effectiveness of a responsibility initiative, not by its digital nature. Notably, customers even showed a significant preference for traditional CSR initiatives over their digital counterparts, despite their equal effectiveness. Furthermore, the distinction between opportunity-based and risk-based CDR did not significantly influence preferences when effectiveness remained constant.

This study makes a key contribution to the academic discourse by questioning whether CDR, despite its conceptual importance, functions as a distinct concept from CSR in the context of stakeholder behavioral reactions and to what extent these concepts overlap in their effects (Carl *et al.*, 2024; Lobschat *et al.*, 2021). Our findings suggest that the strategic value of responsibility initiatives lies in their tangible outcomes rather than their technological framing. This has significant practical implications, indicating that companies should prioritize demonstrating the real-world impact of their actions over simply highlighting their digital sophistication.

The remainder of this paper is structured as follows. Section 2 details our integrated theoretical framework. Section 3 develops our hypotheses. Section 4 describes the research methodology, followed by the analysis and results in Section 5. We discuss our findings, their implications, and the study's limitations in Section 6, and conclude in Section 7.

2 Theoretical Framework

The theoretical foundation of this paper draws on multiple complementary perspectives to examine how CDR might influence stakeholder preferences differently than traditional CSR. Specifically, we focus our analysis on two highly relevant, externally facing stakeholder groups: customers and prospective employees. These groups are crucial because their behavioral responses (e.g., purchasing decisions, application decisions) directly translate the firm's activities into competitive advantage.

The term “preference” in this study refers to an individual's behavioral inclination or choice to favor one organization over another, typically operationalized as organizational attractiveness or job pursuit intentions (Greening and Turban, 2000; Story *et al.*, 2016; Turban and Greening, 1997). We acknowledge the conventional critique stemming from

economic theory, notably advanced by Stigler and Becker (1977), which posits that fundamental tastes and utility functions are stable and undisputable. From this perspective, changes in behavior – such as the inclination towards companies engaged in CDR initiatives – should primarily be explained by shifts in prices or income, or changes in the arguments entering household production functions, rather than altering tastes (Stigler and Becker, 1977). However, this paper examines the psychological and social understanding of preferences for organizations, which are highly influenced by perceived organizational attributes (Greening and Turban, 2000; Turban and Greening, 1997). Consequently, while we assume the stability of deep-seated economic tastes, the observed variance in individual attraction and choice behavior – or preference – is systematically explained by the tangible social and organizational signals (Greening and Turban, 2000; Story *et al.*, 2016; Turban and Greening, 1997) through specific economic and psychological mechanisms detailed in the following sub-sections.

2.1 The Strategic Value of Corporate Responsibility

When examining competitive advantages through the market-based view according to Porter (1980), two predominant positioning strategies are crucial: cost leadership and differentiation. Porter and Kramer (2006) assert that CSR initiatives can be integrated into corporate and competitive strategies for that purpose as well. Empirical evidence supports this notion (Panwar *et al.*, 2016), demonstrating that such integration can foster both differentiation (e.g., McWilliams *et al.*, 2006) and facilitate cost reduction (e.g., Christmann, 2000; Weber, 2008). The latter can be achieved through actions such as increasing operational efficiency or reducing transaction costs (Orlitzky *et al.*, 2011). While these effects yield immediate economic benefits and are therefore important to consider, we focus on indirect effects via the behavioral reactions of customers and prospective employees, for whom CSR and CDR can serve as a differentiating factor (Herden *et al.*, 2021).

As evidenced by meta-analyses from Margolis and Walsh (2003) and Orlitzky *et al.* (2003), there exists a mostly positive relationship between CSR performance and corporate financial performance. Vishwanathan *et al.* (2020), in a meta-analysis, identified the increase in firm reputation, stakeholder reciprocity, innovation capacity, and the reduction of firm risks as overarching explanatory mechanisms for this link. The first two factors, in particular, serve as examples of underlying behavioral mechanisms that are rele-

vant to the stakeholders examined in our study. This link between responsibility, reputation, and financial outcomes has recently been demonstrated in the specific context of CDR as well, with Oduro *et al.* (2024) finding that CDR positively impacted financial performance indirectly by enhancing firm reputation and Vo Thai *et al.* (2024) demonstrating positive effects on sales and the customer base. The implementation of CDR, however, involves what Hartley *et al.* (2024) and Wirtz *et al.* (2023) describe as the “CDR calculus” – organizations must continuously weigh the expected benefits of digital responsibility initiatives against their costs and potential risks.

2.2 CDR as a Dual Approach for Opportunities and Risks

CDR addresses the unique challenges of digitalization, encompassing both the opportunities of employing digital technologies as well as their inherent risks (Cardinali and De Giovanni, 2022). We thus propose that this duality manifests in two distinct approaches to CDR, distinguishing between proactive, value-creating initiatives and defensive, harm-mitigating ones. We adopt the terms “opportunity-based” and “risk-based” to reflect this fundamental distinction between using digital technologies as solutions (leveraging their opportunities) versus addressing digital technologies as sources of negative impacts (mitigating their risks).

Opportunity-based CDR involves leveraging digital technologies to create positive societal value, or digital “handprints”. Examples include using AI to improve healthcare accessibility, implementing blockchain for supply chain transparency, or developing digital platforms for social inclusion. These initiatives represent proactive utilization of digital capabilities for societal benefit. Risk-based CDR focuses on mitigating the negative externalities and risks inherent in digital technologies, or digital “footprints”. This includes establishing ethical AI governance to prevent discriminatory algorithms, implementing comprehensive data minimization practices beyond legal requirements, or investing in energy-efficient computing infrastructure. These initiatives address potential harms arising from digital technology deployment.

This conceptualization aligns with March’s (1991) framework of organizational exploration and exploitation, where opportunity-based CDR represents exploration of new value creation possibilities, while risk-based CDR represents exploitation focused on refinement and risk mitigation within established parameters.

2.3 Theoretical Foundations for Understanding CDR Impact

Signaling Theory

To achieve behavioral effects through corporate responsibility, effective communication of responsibility practices is necessary. This can take various forms, such as certificates, labels, reports, and advertising messages. According to signaling theory (Spence, 1973), all of these can be understood as mechanisms through which organizations build and maintain reputations that serve as costly signals about their underlying characteristics and commitments.

Initially formulated to address information asymmetries in labor markets, signaling theory addresses how parties with private information can credibly convey that information to others (Spence, 1973). In organizational contexts, the theory clarifies how firms communicate unobservable qualities to stakeholders (Connelly *et al.*, 2011; Spence, 2002). Critically, the signal's credibility derives from its costliness – not merely the cost of communication itself, but the reputational capital at stake when making claims about organizational practices (Stiglitz, 2000). Building and maintaining this reputation is costly, and the organization's actions contradicting its claims can quickly destroy it. Thus, stakeholders interpret communicated responsibility initiatives not just as a claim, but as a symbol from which they infer broader organizational characteristics such as ethical values, better working conditions, and an overall positive organizational identity (Greening and Turban, 2000; Story *et al.*, 2016; Turban and Greening, 1997).

Social Identity Theory

Social identity theory (Tajfel and Turner, 1986) provides a socio-psychological perspective to comprehend the intergroup behavior of individuals. At its core, the theory posits that individuals derive a portion of their identity from their membership in social groups, including the organizations for which they work (Turban and Greening, 1997).

Tajfel and Turner (1986) emphasize that individuals integrate parts of the group identity into their own, forming what is termed a social identity. This allows for comparisons with and distinctions from other groups, influencing the way individuals perceive themselves in relation to their social environment. Consequently, the affiliation with a particular social group shapes an individual's self-concept and self-image (Ashforth and Mael, 1989; Dutton *et al.*, 1994; Sen and Bhattacharya, 2001; Tajfel and Turner, 1986; Turban and Greening, 1997).

Since a group's identity is intangible, individuals evaluate it based on its communicated or observed behavior. This is where social identity theory intersects with signaling theory. The assessment of a group compared to others (e.g., through interpreting signals related to the group's image, reputation, and success) influences the positivity or negativity of the social identity derived from that group affiliation (Dutton *et al.*, 1994; Greening and Turban, 2000; Tajfel and Turner, 1986). Tajfel and Turner (1986) assert that individuals strive to enhance their self-worth, driving them to seek a positive social identity. This pursuit becomes a motivational force, leading individuals to consider swapping or altering their group toward a more positively distinct group (Tajfel and Turner, 1986).

Expectation-Disconfirmation Theory

Expectation-disconfirmation theory (Oliver, 1977, 1980) provides a nuanced understanding of how individuals evaluate and react to their experiences with products or services. The theory posits that the discrepancy, or “disconfirmation”, between an individual's expectations and the perceived performance significantly influences satisfaction besides the inherent quality or performance of a product or service. The theory differentiates between positive and negative disconfirmation. Positive disconfirmation occurs when performance exceeds expectations, generally leading to satisfaction. Conversely, negative disconfirmation arises when performance falls short of expectations, leading to dissatisfaction. The outcome of this disconfirmation process can shape consumer attitudes and behaviors, such as repurchase intentions (Oliver, 1980; Venkatesh and Goyal, 2010). While expectation-disconfirmation theory originally focused on consumer satisfaction and behavior related to a product, it can also be extended to attributes that go beyond this, e.g., job satisfaction in an employment setting (e.g., Foa, 1957; Ilgen, 1971; Penning De Vries and Knies, 2023).

2.4 Integrating the Theoretical Perspectives

These three theoretical lenses work together to explain potential stakeholder responses to CDR. Signaling theory explains how and why organizations signal their unobservable digital responsibility commitments and how these signals are interpreted by stakeholders. Social identity theory then illuminates why stakeholders are attracted to organizations that signal a positive and responsible identity, as this aligns with their own pursuit of a positive self-concept (Tajfel and Turner, 1986). Expectation-disconfirmation theory

provides a mechanism for understanding how the specific nature of CDR initiatives (opportunity-based versus risk-based) may lead to different stakeholder evaluations based on their pre-existing expectations about the risks and opportunities of digital technologies. This integrated framework provides a robust foundation for our hypotheses about the differential impacts of various CSR and CDR initiatives on stakeholder preferences.

3 Hypotheses Development

Building on our integrated theoretical framework, we now develop specific hypotheses about how stakeholders respond to different types of corporate responsibility initiatives. We first establish how corporate responsibility functions as a signal before examining the differential effects of CSR versus CDR on stakeholders and subsequently the distinction between opportunity-based and risk-based CDR.

3.1 The Signaling Function of Corporate Responsibility

To achieve behavioral effects through corporate responsibility, effective communication about the corresponding strategic orientation and practices is necessary. These can take various forms, such as certificates, labels, reports, and advertising messages, all functioning as signals intended to provide stakeholders with information about organizational characteristics (Turban and Greening, 1997).

For prospective employees, signaling theory helps to understand how they perceive and interpret information provided by organizations during the recruitment process. Due to incomplete information about organizations' characteristics, job seekers rely on available cues as signals to form impressions of an organization's values and norms (Greening and Turban, 2000). These signals shape perspectives on what it might be like to work within that organization, making them crucial determinants of employer attractiveness (Greening and Turban, 2000; Story *et al.*, 2016). CSR initiatives, when communicated effectively, are interpreted by prospective employees as indicators of fairness and ethical behavior (Aguilera *et al.*, 2007). Engaging in CSR activities that raise the company's reputation can enhance its attractiveness as an employer not only by creating the appearance of better working conditions but also by aligning organizational values with those of prospective employees as well as enhancing and reinforcing their self-concept (Jones *et al.*, 2014; Story *et al.*, 2016; Turban and Greening, 1997). Overall, multiple studies have

found a positive correlation between a company's social performance and its attractiveness to prospective employees (e.g., Albinger and Freeman, 2000; Backhaus *et al.*, 2002; Jones *et al.*, 2014; Story *et al.*, 2016; Turban and Greening, 1997).

Similarly, customers engage in identification processes with companies when they evaluate not only specific products but also the producing organization (Sen and Bhattacharya, 2001). When customers interpret signals in ways that align perceived organizational characteristics, values, and attitudes with their self-concept, consumer-company identification is reinforced, leading to various benefits, including enhanced purchase intentions (Bhattacharya and Sen, 2003; Lichtenstein *et al.*, 2004; Luo and Bhattacharya, 2006; Sen and Bhattacharya, 2001). By communicating CSR initiatives, companies convey social attitudes that create the impression among customers that consumption supports a good cause, enhancing self-worth through purchase decisions (McWilliams and Siegel, 2001).

3.2 Differential Effects of CSR and CDR on Stakeholder Preferences

Since we consider CDR as a cross-functional aspect of CSR, we assume that the integration of CDR into the corporate strategy, as well as CDR initiatives at the operational level, can generally lead to competitive advantages. There is a consensus in the literature that CSR and CDR have large conceptual overlaps (e.g., Carl *et al.*, 2024; Lobschat *et al.*, 2021; Mihale-Wilson *et al.*, 2021), although opinions differ as to whether CDR should be considered separately from CSR. As subordinate concepts under corporate responsibility, both have the goal of minimizing negative and maximizing positive impacts of the organization's activities (Carl *et al.*, 2024). Due to the mutual commitment to responsibility and sustainability as well as pro-environmental and pro-social values, we posit, in alignment with Lobschat *et al.* (2021), that CDR also leads to competitive advantages. Specifically, though not exclusively, we anticipate an increased preference among both customers and prospective employees. For some specific CDR initiatives, Carl *et al.* (2024) were already able to identify and differentiate consumers' preferences in a discrete choice experiment. Previously, Mihale-Wilson *et al.* (2021) had empirically investigated customer preference for overarching CDR-related norms. However, since we want to investigate possible differences in the effects of CSR and CDR, it is necessary to focus on the conceptual and content-related distinctions of CDR compared to CSR.

Lobschat *et al.* (2021) were among the first in English literature to conceptually engage with CDR. In addition to providing a definition and systematically analyzing stakeholders of CDR, the authors identify three essential distinct characteristics of digital transformation that necessitate an independent examination of the associated opportunities and risks, thereby forming the concept of CDR – exponential development, malleability, and pervasiveness. All three distinctive characteristics underscore the arguments for a potentially stronger impact of CDR on stakeholders compared to traditional (non-digital) CSR. The exponential development of digital technologies (Moore, 1965) not only brings forth continuous innovation but also introduces unprecedented opportunities and risks (Carl *et al.*, 2024; Mihale-Wilson *et al.*, 2021), affecting both society and organizations and making timely digital responsibility more critical. The malleability of digital technologies enables swift adaptations to diverse applications, whether intentional or unintentional. This characteristic intensifies the complexity and opacity of consequences, rendering them impossible to fully predict. From a signaling perspective, this opacity might enhance the value of CDR signals. When organizations successfully navigate this complexity, they demonstrate superior competence that traditional CSR cannot match. The signal becomes more valuable precisely because the underlying challenge is more demanding. The pervasiveness of digital technologies across various aspects of life further intensifies the amount and extent of their impacts on individuals, potentially translating into enhanced signal salience.

From these characteristics, we derive several factors that we believe influence why CDR might be more appreciated by stakeholders than traditional CSR. The combination of the exponential growth and malleability of digital technologies substantially raises the level of opacity and uncertainty regarding their consequences. Therefore, we posit that stakeholders perceive the opportunities and risks associated with digital technologies as inadequately considered. Such an attitude would enhance the potential for stronger identification and recognition when CDR initiatives effectively address these concerns. Additionally, the pervasiveness of digital technologies, coupled with the aforementioned characteristics, could lead stakeholders to anticipate more profound positive and negative impacts compared to non-digital technologies. This anticipation could, in turn, also contribute to a heightened appreciation and acknowledgment of CDR initiatives. Lastly, given that digital technologies are the distinguishing feature of CDR, an individual's level of

technology acceptance could shape how stakeholders view the underlying digital initiatives. A conservative attitude towards digital technologies could, of course, have a negative effect. Assuming a general openness among the average population, we conclude that digital technologies and innovation, in general, are positively connotated and appreciated here as well.

The foregoing arguments thus lead us to formulate the first hypothesis as follows:

***H₁:** CDR initiatives lead to increased preference in customers and prospective employees, above and beyond the effects driven by CSR initiatives.*

3.3 Differential Effects of Opportunity-Based and Risk-Based CDR

The focus on digital technologies introduces a conceptual distinctiveness for CDR, as they carry the potential for both positive and negative consequences, which is generally recognized by the public (Herden *et al.*, 2021), resulting in two distinct perspectives.

To understand differential stakeholder responses to opportunity-based and risk-based CDR, we apply expectation-disconfirmation theory (Oliver, 1977, 1980). The deviation of perceived performance from expectations is substantially influential for consumer attitude and behavior. In the CDR context, this mechanism operates differently for opportunity-based versus risk-based initiatives. For individuals holding predominantly negative stances toward digital technologies, risk-based CDR merely fulfills corresponding expectations – companies should manage digital risks. This confirmation produces neutral affective responses. However, opportunity-based CDR creates positive disconfirmation by exceeding these negative expectations, demonstrating that digital technologies can promote responsibility. According to the theory, this positive disconfirmation leads to stronger positive responses than mere expectation confirmation. Conversely, individuals with positive attitudes toward digital technologies see their expectations fulfilled by opportunity-based CDR. Their positive orientation may stem from a preference for innovation (Galbreath, 2009) or general technology acceptance. For these stakeholders, risk-based CDR creates negative disconfirmation – focusing on digital dangers contradicts their optimistic technology narrative. The expectation-disconfirmation mechanism creates an asymmetric pattern favoring opportunity-based CDR in both cases. For technol-

ogy skeptics, it provides a positive surprise that strongly enhances preferences. For technology optimists, it confirms positive expectations while avoiding the potential negativity of excessive risk focus.

Therefore, we posit the following hypothesis:

H₂: Opportunity-based CDR initiatives lead to higher preferences in customers and prospective employees than risk-based CDR initiatives.

4 Methodology and Research Design

4.1 Data Collection and Sample

We tested our hypotheses by conducting an experimental vignette study using the online survey platform Bilendi (formerly Respondi). Vignette studies are particularly well-suited for examining stakeholder preferences, as they allow researchers to systematically manipulate specific aspects while holding others constant (Aguinis and Bradley, 2014). This approach is widely used in business ethics and CSR research due to its ability to isolate causal effects while maintaining experimental control (O’Fallon and Butterfield, 2005). Our sample consisted of 150 adults residing in Germany. We deliberately applied no additional selection criteria to ensure adequate representation of both customer and prospective employee perspectives. Since our theoretical framework builds on behavioral theory rather than economic theory, participants were not incentivized based on performance but were instead remunerated a fixed amount for their participation.

The average participant was 49 years old and had 24 years of working experience. Table C-1 presents detailed sample characteristics.

Table C-1: Sample Characteristics

	Frequency	Percentage
<i>Gender</i>		
Male	65	43.3%
Female	85	56.7%
<i>Age</i>		
Under 25	7	4.7%
25-34	24	16%
35-44	18	12%
45-54	35	23.3%
55-64	44	29.3%
Over 64	22	14.7%
<i>Educational Level</i>		
Certificate of Secondary School / Vocational Training	25	16.7%
General Certificate of (Technical) Secondary School	60	40%
Abitur (A Levels)	30	20%
Bachelor's Degree	15	10%
Master's Degree	18	12%
Doctorate / PhD	2	1.3%

4.2 Experimental Design

Our experiment employed a 3×2 within-subjects design with two between-subjects conditions (stakeholder role). Each participant was randomly assigned to exclusively one stakeholder role (customer or prospective employee) and evaluated four scenarios, each consisting of two vignettes describing how two fictional companies had caused the same negative societal effects. The company in the first vignette (control vignette) did not take any action. In the second vignette, two within-subjects manipulations were incorporated: the initiative implemented by the company (CSR, mere digitalization, CDR) and the type of externality of the digital technologies employed (negative, positive; nested in digitalization and CDR). The specific textual manipulation logic for these initiative types, illustrated by an example scenario, is presented in Table C-2.

Table C-2: Exemplary Overview of Vignettes

Vignette Type	Text Anchor (Example: Greenhouse Gas Scenario, shortened)
Control	Production uses <i>non-digital</i> technical equipment consuming large amounts of brown energy. <i>No corrective initiatives</i> are implemented.
- not digital	
- no responsibility	
CSR	Production uses <i>non-digital</i> technical equipment consuming large amounts of brown energy. Management initiates a <i>gradual transition to renewable energy</i> .
- not digital	
- responsibility	
Digitalization	Production uses <i>digital</i> technical equipment consuming large amounts of brown energy. <i>No corrective initiatives</i> are implemented.
- digital	
- no responsibility	
CDR	Production uses <i>digital</i> technical equipment consuming large amounts of brown energy. Management initiates a <i>gradual transition to renewable energy</i> .
- digital	
- responsibility	

For the operationalization of CSR and CDR initiatives, we have exclusively considered corrective initiatives in the scenarios. This is because a direct connection between the initiative and the caused damage can elicit a stronger reaction from stakeholders (Nickerson *et al.*, 2022). Furthermore, we have emphasized in all scenarios that legal requirements are met even without taking measures. Thus, the CSR and CDR initiatives go beyond legal obligations and are therefore considered voluntary, which is regarded as a core characteristic of corporate responsibility in the literature (Carl *et al.*, 2024; Sarkar and Searcy, 2016). CDR was distinguished from CSR by specifically involving digital causes or initiatives. Digitalization, on the other hand, described the same digital causes or initiatives but without being linked to societal benefits, thus lacking the character of responsibility. This allowed us to isolate the effect of digitalization in the analysis and differentiate it from CDR. We kept the extent of damage constant in the initial situations, as well as its reduction when assuming responsibility, leading to equal end states. It was necessary to establish comparable starting and end states to ensure a correct and unambiguous interpretation of the differing effects of CSR, risk-based CDR, and opportunity-based CDR. Additionally, participants were explicitly informed that the companies' products were entirely identical, cost the same, and were regularly needed. For the employee role,

job positions, tasks, and salaries were held constant. This ensured that preferences would be driven solely by the responsibility initiatives rather than product or job characteristics. Different designations for the companies (i.e., using different letters and numbers) were employed in each scenario to clearly differentiate the companies and thus avoid spillover effects between the scenarios.

In total, there were 12 unique constellations, out of which each participant was presented four. The order of scenarios was randomized to eliminate order effects.

4.3 Variable Measurement

Dependent Variable: Stakeholder Preference

Our dependent variable captured stakeholder preferences between companies. Rather than measuring absolute evaluations, we focused on relative preferences to reflect real-world decision contexts where stakeholders choose between alternatives. For customers, participants indicated their purchase preference on a 6-point Likert scale ranging from “Exclusively from Company A” to “Exclusively from Company B”. This operationalization reflects actual consumer choice situations where customers select between competing offerings. For prospective employees, participants indicated their employment preference using an analogous 6-point Likert scale from “Exclusively for Company A” to “Exclusively for Company B”. This approach captures the comparative evaluation process characteristic of job selection decisions.

We centered these scales at zero, with negative values indicating preference for the control company and positive values indicating preference for the company implementing responsibility or digitalization initiatives. This transformation facilitates interpretation, as zero represents indifference between options.

Independent Variables: Responsibility and Digitalization Initiatives

CSR initiatives involved traditional non-digital solutions addressing the societal impact (e.g., ergonomic equipment to reduce physical strain, employee training programs). CDR initiatives specifically incorporated digital technologies in addressing societal impacts (e.g., software solutions reducing physical strain, digital training programs). Mere digitalization employed the same digital technologies but did not connect them to societal benefits, which isolated the effect of digitalization from any sense of responsibility. This

allowed us to disentangle whether preferences were driven by digital innovation per se or by its responsible application. Our vignettes can be obtained from Appendices C-II–C-V.

Theoretical Constructs and Control Variables

To explore potential mechanisms underlying CDR effects, we developed several constructs derived from Lobschat *et al.*'s (2021) distinguishing characteristics of digital technologies as explained in our hypotheses development. Participants reported their perception of how strongly companies recognize or anticipate and consider the opportunities and risks of digital technologies (“consideration”). We hereby aimed to address the characteristics that digital technologies are developing exponentially fast and are increasingly opaque and malleable in their effects compared to non-digital technologies (Lobschat *et al.*, 2021). Since digital technologies are also pervasive, participants also had to indicate to what extent they perceive that digital technologies have relatively more extensive negative and positive consequences for them and society (“negative consequences”, “positive consequences”). Finally, we included technology acceptance items from Venkatesh *et al.* (2012) to measure general attitudes toward digital technology use. The descriptive statistics for these constructs can be obtained from Table C-3.

Table C-3: Descriptive statistics of potential drivers of the CDR Effect

	<i>N</i>	Mean	SD	Min.	Max.
Consideration	150	6.45	2.11	2	12
Negative Consequences	150	6.83	2.48	2	12
Positive Consequences	150	7.00	2.15	2	12
Technology Acceptance	150	22.85	6.63	6	36

Min.: minimum, Max.: maximum, SD: standard deviation.

Control variables included standard demographics (age, gender, education, work experience) following Albinger and Freeman (2000), who demonstrated their influence on CSR perceptions. Given the ethical nature of corporate responsibility, we controlled for religiosity and social desirability using established scales (Feder and Weißenberger, 2019; Paulhus, 1984; Winkler *et al.*, 2006).

Detailed measurement items for these constructs are provided in Appendix C-I.

4.4 Analytical Approach

The statistical analysis of the collected data was conducted using STATA and included simple descriptive statistics and *t*-tests, as well as ordinary least squares (OLS) regressions to test our hypotheses. All multi-item constructs were created by summing constituent items after reliability assessment.

To test H₁, we regressed preference on initiative type (CSR, digitalization, CDR) with CDR as the reference category, allowing direct comparison of effect sizes. For H₂, we added the externality type and its interaction with initiative type to examine differential effects of opportunity-based versus risk-based approaches. We initially included the control variables to assess robustness; however, we subsequently excluded them when it became evident that they did not substantially alter the results. We also looked at the variance inflation factors to check for multicollinearity, which did not indicate any difficulties either. Supplemental analyses explored whether the theoretical CDR characteristics (consideration, perceived consequences, technology acceptance) explained any observed CDR effects, allowing insights into potential underlying mechanisms.

5 Analysis and Results of Hypotheses Testing

5.1 Descriptive Statistics

Table C-4 presents the descriptive statistics for stakeholder preferences across different corporate responsibility and digitalization initiatives. The preference variable captures the relative evaluation of participants between two companies, where positive values indicate preference for the company implementing responsibility or digitalization initiatives, negative values indicate preference for the control company, and zero represents indifference. Higher means above 0 imply a higher preference for companies implementing respective initiatives. The significance indicates whether the mean is statistically different from zero. Examining the patterns across initiatives, we observe that both CSR and CDR generate positive mean preferences among both the customer (CSR: $M = 1.42$, $p < .001$; CDR: $M = 1.11$, $p < .001$) and employee stakeholder groups (CSR: $M = 1.47$, $p < .001$; CDR: $M = 1.51$, $p < .001$). These positive values indicate that participants, unsurprisingly, consistently preferred companies implementing responsibility initiatives over those

maintaining the status quo, aligning with the psychological and economic mechanisms proposed by signaling theory and social identity theory.

To further disentangle whether this preference is anchored in the ethical dimension of the initiatives or merely in the adoption of modern technology, the analysis of mere digitalization serves as a critical baseline. Notably, mere digitalization also yields significant positive effects, though substantially weaker than responsibility-oriented initiatives (customers: $M = 0.28, p < .05$; employees: $M = 0.35, p < .05$). This suggests that while technological innovation alone carries some appeal, its impact remains limited compared to initiatives explicitly linked to societal benefits.

Table C-4: Descriptive statistics of participants' decisions (Preference)

	Initiative	<i>N</i>	Mean	SD	Min.	Max.
Customer	CSR	99	1.42***	1.26	-2.5	2.5
	Dig	105	0.28*	1.16	-2.5	2.5
	CDR	96	1.11***	1.29	-2.5	2.5
Employee	CSR	95	1.47***	1.32	-2.5	2.5
	Dig	98	0.35*	1.38	-2.5	2.5
	CDR	107	1.51***	1.15	-1.5	2.5

Min.: minimum, Max.: maximum, SD: standard deviation. The statistical significance of the mean being different from 0 (= indifference) is indicated by * for $p < .05$, ** for $p < .01$ and *** for $p < .001$.

5.2 Hypothesis Testing

Table C-5 presents the regression results testing H_1 , which proposed that CDR initiatives would lead to higher stakeholder preferences than CSR initiatives. Using CDR as the reference category allows direct comparison of effects. The entries and coefficients are interpreted as follows: The constant represents the baseline preference for CDR initiatives over having no measures (e.g., 1.11 out of 2.5 for customers) and its significance indicates statistical distinctiveness from zero (which would indicate indifference). The coefficients for CSR and digitalization are added to this baseline value and interpreted analogously. For example, the digitalization preference is calculated as $1.11 + (-0.83) = 0.28$. These calculated absolute preferences align with the results of the descriptive statistics (Table

C-4). The significance of a coefficient indicates that its effect is statistically different from the baseline effect of CDR initiatives.

For prospective employees, we find no significant difference between CSR and CDR effectiveness ($\beta = -0.04, p > .10$), suggesting these stakeholders value traditional and digital responsibility initiatives equally. However, among customers, CSR initiatives generate significantly higher preferences than CDR ($\beta = 0.30, p < .05$), directly contradicting H₁. Both stakeholder groups show strong negative reactions to mere digitalization compared to CDR (customers: $\beta = -0.83, p < .001$; employees: $\beta = -1.15, p < .001$), confirming that CDR effects are substantially driven by the responsibility aspects rather than the mere digitalization.

Table C-5: OLS Regression Results for Hypothesis 1

	Customers	Employees
CSR	0.30*	-0.04
Digitalization	-0.83***	-1.15***
Constant	1.11***	1.51***
N	75	75
R²	0.1355	0.1480

Table C-5 shows the results obtained by OLS regression with preference as dependent variable. The entries represent the coefficients (β), relative to the reference group CDR, and the respective statistical significance is indicated by * for $p < .05$, ** for $p < .01$ and *** for $p < .001$. Control variables were included as a robustness check and did not substantially influence the results. They were therefore excluded from the final analysis.

Table C-6 examines H₂ by incorporating externality type as a moderator. The externality variable distinguishes between risk-based CDR (coded as 0) and opportunity-based CDR (coded as 1). The interaction terms test whether these CDR orientations generate differential stakeholder responses.

The results provide no support for H₂. Neither customer nor employee preferences differ significantly between risk-based and opportunity-based CDR, as evidenced by the non-significant CDR $\times$ Externality interaction terms (customers: $\beta = 0.08, p > .10$; employees: $\beta = -0.02, p > .10$). This suggests stakeholders focus primarily on the

outcomes of responsibility initiatives rather than whether digital technologies serve as sources of problems or solutions.

Interestingly, the digitalization $\times$ externality interaction proves significant for employees ($\beta = 0.90, p < .05$), indicating that prospective employees respond more favorably to digitalization initiatives when technologies are framed as solutions rather than sources of harm. This pattern does not extend to CDR initiatives, where the responsibility framing appears to override concerns about technological roles.

Table C-6: OLS Regression Results for Hypothesis 2

	Customers	Employees
CSR	0.01	-0.34
Digitalization	-0.92***	-1.57***
(CDR x) Externality	0.08	-0.02
CSR x Externality	0.61	0.63
Digitalization x Externality	0.13	0.90*
Constant	1.08***	1.52***
N	75	75
R²	0.1599	0.1963

Table C-6 shows the results obtained by OLS regression with preference as dependent variable. The entries represent the coefficients (β), relative to the reference group CDR, and the respective statistical significance is indicated by * for $p < .05$, ** for $p < .01$ and *** for $p < .001$. Externality is 0 for negative and 1 for positive externalities of digital technologies. Control variables were included as a robustness check and did not substantially influence the results. They were therefore excluded from the final analysis.

5.3 Results of Supplemental Analysis

To explore potential mechanisms underlying CDR effects, we additionally examined whether theoretical characteristics distinguishing digital from traditional technologies might explain preference patterns. The dependent variable in this exploratory analysis was the preference stated by the respondents in the CDR vignettes. As potential indicators, we assessed participants' perceptions regarding: (1) whether companies adequately consider digital opportunities and risks, (2) and (3) the relative magnitude of positive and

negative digital consequences, and (4) general technology acceptance (see Appendix C-I for measurement items).

Table C-7 presents regression results examining these potential drivers of CDR preferences. Across all models, none of the proposed mechanisms show significant relationships with stakeholder preferences. The consistently low R^2 values (ranging from 0.0063 to 0.0766) and non-significant coefficients suggest these theoretical CDR characteristics do not explain variation in stakeholder responses.

Table C-7: Results Supplemental Analysis

	Customers		Employees	
	Risk	Opportunity	Risk	Opportunity
Consideration	-0.00	-0.03	0.10	-0.02
Negative Consequences	-0.01	-0.05	-0.01	0.00
Positive Consequences	-0.00	0.03	0.07	0.15
Technology Acceptance	-0.01	0.01	-0.04	-0.00
Constant	1.52	1.15	1.40	0.67
<i>N</i>	55	32	47	46
R^2	0.0063	0.0257	0.0766	0.0552

Table C-7 shows the results obtained by OLS regression with preference as dependent variable for CDR vignettes only. The entries represent the coefficients (β), and the respective statistical significance is indicated by * for $p < .05$, ** for $p < .01$ and *** for $p < .001$.

6 Discussion

6.1 Discussion of Main Findings

Our study offers nuanced insights into stakeholder perceptions of corporate responsibility, challenging the notion that digital approaches are inherently superior to traditional methods in terms of stakeholder preferences. The findings generally align with the theoretical foundation of signaling theory and social identity theory as well as related empirical research, highlighting the positive influence of CSR and CDR on stakeholder preferences. However, the investigated differences in the impacts of these initiatives provide a rich ground for discussion. Given the nascent state of CDR research, our findings

contribute to understanding whether and how stakeholders differentiate between traditional and digital forms of corporate responsibility.

The data analysis reveals that both CSR and CDR positively influence preferences of customers and prospective employees, supporting the general assumption and previous empirical research that stakeholders value corporate efforts towards responsibility and sustainability (e.g., Albinger and Freeman, 2000; Backhaus *et al.*, 2002; Bhattacharya and Sen, 2003; Jones *et al.*, 2014; Lichtenstein *et al.*, 2004; Luo and Bhattacharya, 2006; Sen and Bhattacharya, 2001; Story *et al.*, 2016; Turban and Greening, 1997). However, our research design is less nuanced in this regard, as we did not want to examine the absolute but relative preferences. In the individual scenarios, participants faced no downside when choosing a responsible company, giving them a dominant choice.

The results of our hypothesis testing, despite not supporting either of our hypotheses, still provide valuable insights.

First, the statistical evidence contradicts the idea that CDR initiatives lead to a higher preference among customers and prospective employees compared to CSR initiatives in the setting we investigated. The similar effectiveness of CSR and CDR initiatives among prospective employees suggests that they value both traditional and digital forms of corporate responsibility, viewing them as complementary rather than mutually exclusive (Lobschat *et al.*, 2021; Mihale-Wilson *et al.*, 2021). Second, we did not find support for a difference in the effects of risk-based and opportunity-based CDR on stakeholder preferences. If the initiatives lead to the same level of responsibility, it does not matter to customers or employees whether digital technologies caused the damage or reduced it.

These unexpected results invite deeper theoretical reflection. From an outcome-focused perspective, our findings align well with means-end chain theory. Gutman (1982) posits that consumers evaluate products and actions based on a hierarchy of attributes, the consequences they produce, and the personal values they ultimately serve. This framework explains why in our experimental context, where the key consequence (effectiveness of initiatives) was held constant, the underlying attributes of the solution (i.e., its technological nature as CSR versus CDR or risk-based CDR versus opportunity-based CDR) had no systematic effect on stakeholder preference. The loss frame in our scenarios may have further reinforced this outcome orientation. When presented with situations involving environmental damage or employee harm, stakeholders' primary concern appears to be

remediation rather than the specific approach taken. This scenario could resonate with prospect theory (Kahneman and Tversky, 1979), which demonstrates that losses carry more significance than gains in decision-making. Consequently, a loss itself could become so prominent that factors unrelated to its resolution, such as technological sophistication, receive at most secondary consideration. Future research should explore whether gain-framed scenarios (i.e., where damage is not merely reduced or remedied, but where an original positive value is created) might yield different stakeholder preferences. The salience of the negative start-state may have overshadowed any potential differentiation based on technological means.

Though, these considerations do not explain why there is a contradictory significant effect for customers, i.e., why they have a higher preference for CSR compared to CDR. A significantly higher punishment of damages caused by digital technologies does not emerge from the data. Instead, further analyses indicate that the effect is due to a lower preference for digital solutions compared to non-digital solutions among customers. This could be influenced by several factors. For instance, the perception of technology could play a decisive role. Customers might perceive digital solutions as more complex or less trustworthy, even if equally effective. Also, customer expectations and habits might be influential as well. Customers may continue to prefer more established non-digital solutions if they have become accustomed to them. However, this discrepancy cannot be explained by the factors we investigated. Ultimately, only an in-depth analysis of these aspects can provide further insights into customer preference.

6.2 Insights from the Supplemental Analysis

To better understand why CDR did not generate the anticipated differential effects, we examined whether the theoretical characteristics distinguishing digital from traditional technologies might explain stakeholder preferences. Specifically, we assessed whether participants' perceptions regarding companies' consideration of digital opportunities and risks, the relative magnitude of digital consequences, and general technology acceptance would predict CDR preferences.

The supplemental analysis yielded consistent null results across all proposed mechanisms. This null finding reinforces our main results: stakeholders appear to primarily evaluate responsibility initiatives based on their effectiveness in addressing societal im-

pacts rather than the specific characteristics or perceived consequences of the technologies involved. The absence of significant relationships holds across both stakeholder groups and both CDR orientations, providing converging evidence that the digital nature of responsibility initiatives may be less salient to stakeholders than anticipated.

This finding is particularly noteworthy because it challenges the theoretical foundations underlying our hypotheses. The distinguishing characteristics of digital technologies – their exponential development, malleability, and pervasiveness – do not appear to translate into differential stakeholder evaluations when these technologies are employed for corporate responsibility purposes. This suggests that while these characteristics may be crucial for understanding organizational challenges and opportunities in digital transformation, they may not shape stakeholder perceptions in the expected manner.

6.3 Theoretical Implications

Our findings contribute to the theoretical discourse by refining the application of signaling theory, social identity theory, and expectation-disconfirmation theory within the digital responsibility domain.

First, we extend signaling theory (Connelly *et al.*, 2011; Spence, 1973) by identifying outcome salience (Haunschild and Miner, 1997) as a critical boundary condition. Our results suggest that the signaling value of technological sophistication is secondary to the perceived impact of an initiative. In the context of corporate responsibility, stakeholders appear to prioritize the “what” (remediation of harm) over the “how” (digital vs. traditional means), indicating that complex digital signals do not automatically generate incremental legitimacy.

Second, regarding social identity theory (Tajfel and Turner, 1986), our study shows that “digital” responsibility does not offer a more distinct organizational identity than traditional CSR. Instead, stakeholder identification seems driven by a rather technology-agnostic moral-based identity. This implies a hierarchy of identity-forming attributes where ethical core values override the technological nature of the corporate action.

Third, the indifference between opportunity-based and risk-based CDR challenges the applicability of expectation-disconfirmation theory (Oliver, 1980) in this context. Rather than responding differently based on whether digital technologies exceed or meet expectations, stakeholders appear to evaluate all responsibility initiatives through a similar lens. This suggests that the theoretical mechanisms of positive and negative disconfirmation

regarding the means of responsibility initiatives may be less salient, at least in a loss frame.

Overall, these insights challenge the assumption that CDR represents a categorically distinct phenomenon from CSR in terms of stakeholder perceptions and behavioral responses. While conceptual arguments for treating CDR as a unique construct remain valid from an organizational and management perspective (Herden *et al.*, 2021; Lobschat *et al.*, 2021), our results suggest that stakeholders may not share this differentiation when evaluating corporate responsibility initiatives. This lack of external differentiation likely stems from the pervasiveness of digital technologies in modern society (Lobschat *et al.*, 2021). As digital tools become seamlessly embedded in almost every business process, the “digital” label loses its signaling power as a distinct category of responsibility in the eyes of external stakeholders. Consequently, while CDR remains a highly relevant framework for internal managerial orientation and technical implementation, it appears to merge with the broader construct of CSR at the point of stakeholder perception. These findings contribute to the ongoing debate regarding the relationship between CDR and CSR (Carl *et al.*, 2024; Mihale-Wilson *et al.*, 2021) by supporting an integrated perspective. Rather than viewing these constructs as hierarchically distinct or mutually exclusive, our results suggest that digital and traditional responsibility approaches function as complementary tools for achieving overarching societal objectives.

6.4 Practical Implications

For practitioners, our findings offer important guidance for corporate responsibility strategy and communication. The preference for CSR over CDR among customers, despite equal effectiveness, suggests that organizations should carefully consider how they frame and communicate their responsibility initiatives. While digital solutions may offer operational advantages, emphasizing traditional approaches may resonate more strongly with certain stakeholder groups on this level.

The lack of differentiation between opportunity-based and risk-based CDR has implications for resource allocation and strategic focus. Rather than assuming that leveraging digital technologies for positive outcomes will generate superior stakeholder responses, managers should focus on demonstrating tangible societal impact regardless of the technological approach. We must emphasize that this principle applies only to operational

initiatives, as employed in our analysis, and leave strategic CDR initiatives open for further investigation.

6.5 Limitations and Future Research

However, this study and its results are not without their limitations. First, our experimental design focused exclusively on corrective initiatives (Nickerson *et al.*, 2022) in loss-framed scenarios. This focus does not capture the potential of compensatory or goodwill-cultivating initiatives, which could exhibit different impacts on stakeholder perceptions. The same is also applicable to inherently proactive CDR initiatives (Groza *et al.*, 2011; Wagner *et al.*, 2009), since we only considered reactive ones. Future research should explore whether our findings hold in gain-framed contexts where organizations create original positive value rather than merely remedying negative impacts. Stakeholders might perceive such initiatives as more innovative, leading to greater impacts on their preferences (Galbreath, 2009).

Second, our operationalization of CDR focused on digital technologies in organizational processes rather than as integral components of products and services. Digital transformation increasingly blurs the boundaries between process and product innovation, and stakeholder responses may differ when evaluating digitally enabled products versus digitally enhanced responsibility practices.

Third, we examined only two stakeholder groups – customers and prospective employees. Other stakeholders such as investors, regulators, or non-governmental organizations, may have different expectations and preferences regarding digital responsibility.

Finally, our focus on behavioral intentions rather than actual behaviors represents another limitation. While vignette studies provide valuable insights into decision-making processes, field studies examining actual stakeholder choices would strengthen our understanding of CDR's real-world impact.

7 Conclusion

This study aimed to investigate whether the digital nature of corporate responsibility initiatives influences stakeholder preferences differently than traditional CSR approaches. Grounded in signaling theory, social identity theory, and expectation-disconfirmation

theory, we examined how customers and prospective employees evaluate CSR versus CDR initiatives, as well as opportunity-based versus risk-based CDR orientations.

Our findings challenge fundamental assumptions about the distinctiveness of digital responsibility. Rather than revealing a preference for technologically sophisticated CDR initiatives, we discovered that stakeholders primarily value the effectiveness of responsibility initiatives regardless of their digital nature. Most notably, customers demonstrated a significant preference for traditional CSR over CDR initiatives, even when outcomes were held constant. This unexpected result suggests that the assumed appeal of digital technology may not extend to corporate responsibility contexts as previously theorized. The study makes several contributions to the emerging CDR literature. First, it provides empirical evidence that stakeholders may not perceive CDR as categorically distinct from CSR, despite conceptual arguments for their differentiation. Second, it demonstrates that the orientation of CDR does not significantly influence stakeholder preferences when effectiveness is equal, highlighting the primacy of tangible outcomes over technological sophistication in shaping stakeholder evaluations.

These insights have important implications for both theory and practice. Theoretically, they suggest that while CDR may require distinct organizational capabilities and governance structures, its stakeholder impact mechanisms may overlap substantially with traditional CSR. Practically, they indicate that organizations should prioritize demonstrating real-world impact rather than emphasizing the digital nature of their responsibility initiatives.

As digital transformation reshapes business and society, understanding how stakeholders perceive and value different forms of corporate responsibility remains crucial. Our findings suggest that in the realm of corporate responsibility, digital is not automatically better – effectiveness is what matters most to stakeholders. Future research should explore whether these patterns persist across different contexts, framings, and stakeholder groups, ultimately contributing to a more nuanced understanding of corporate responsibility in the digital age.

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Appendices

Appendix C-I: Questionnaire Items

Variable	Items
Age	Please indicate your age. ... years
Gender	Please indicate your gender. Male / Female
Education	Please indicate your highest educational qualification. - Certificate of secondary school / vocational training - General certificate of (technical) secondary school - Abitur (A-levels) - Bachelor's degree - Master's degree - Doctorate / PhD
Experience	How many years of professional experience do you have? ... years
Social Desirability^a	How do you personally rate the following statements? - I have received too much change back and said nothing. - I am always honest with others. - I have occasionally taken advantage of someone.
Religiosity^b	How religious are you?
Consideration^c	How do you personally rate the following statements? - The societal risks of using digital technologies and data are sufficiently anticipated and considered by companies. - The societal opportunities of using digital technologies and data are sufficiently recognized and utilized by companies.

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Variable	Items
Negative Consequences^c	How do you personally rate the following statements?
	- Digital technologies and data can have stronger negative impacts on society and the environment than non-digital technologies. - Digital technologies and data can have stronger negative impacts on me personally than non-digital technologies.
Positive Consequences^c	How do you personally rate the following statements?
	- Digital technologies and data can have stronger positive impacts on society and the environment than non-digital technologies. - Digital technologies and data can have stronger positive impacts on me personally than non-digital technologies.
Technology Acceptance^c	How do you personally rate the following statements?
	- With the help of digital technologies, I can make decisions or complete tasks faster. - It usually does not take me long to acquire skills in digital technologies. - I enjoy using digital technologies. - I have the necessary knowledge to use digital technologies. - People whose opinions are important to me advise me to use digital technologies. - I intend to use more digital technologies in the future.

^a Six-point Likert scale “Does not apply at all.” to “Applies completely.”.

^b Six-point Likert scale “Not at all religious.” to “Very religious.”.

^c Six-point Likert scale “Strongly disagree.” to “Strongly agree.”.

Appendix C-II: All Variants of Vignettes for Scenario 1 (Opportunity-Based)

Control Vignette

Company 1 produces a highly demanded and successful product. The manufacturing process requires large quantities of water. A significant portion of the used water is eventually pumped into the adjacent lake. Environmentally harmful substances that are generated during production and enter the water accumulate in the lake. As a result, several animal and plant species could no longer survive in the lake. Management addressed the question of whether and how to act.

Eventually, an analysis of pollutant levels was ordered. The results of the investigation showed that the concentration of environmentally harmful substances remains just below the legally permitted maximum levels in the long term. No further initiatives were initiated due to compliance with legal requirements. The biodiversity in the lake has remained low.

CSR Vignette

Company 2 produces a highly demanded and successful product. The manufacturing process requires large quantities of water. A significant portion of the used water is eventually pumped into the adjacent lake. Environmentally harmful substances that are generated during production and enter the water accumulate in the lake. As a result, several animal and plant species could no longer survive in the lake. Management addressed the question of whether and how to act.

Eventually, an analysis of pollutant levels was ordered. The results showed that the concentration of environmentally harmful substances remains just below the legally permitted maximum levels in the long term. Nevertheless, new manufacturing processes were implemented. Water pollution now remains significantly below the legally permitted maximum levels in the long term. The biodiversity in the lake has increased again since then.

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Digitalization Vignette

Company 2 produces a highly demanded and successful product. The manufacturing process requires large quantities of water. A significant portion of the used water is eventually pumped into the adjacent lake. Environmentally harmful substances that are generated during production and enter the water accumulate in the lake. As a result, several animal and plant species could no longer survive in the lake. Management addressed the question of whether and how to act.

Eventually, an analysis of pollutant levels using digital technologies was ordered. The results showed that the concentration of environmentally harmful substances remains just below the legally permitted maximum levels in the long term. Furthermore, new manufacturing processes were implemented using digital technologies. No further initiatives were initiated. The biodiversity in the lake has remained low.

CDR Vignette

Company 2 produces a highly demanded and successful product. The manufacturing process requires large quantities of water. A significant portion of the used water is eventually pumped into the adjacent lake. Environmentally harmful substances that are generated during production and enter the water accumulate in the lake. As a result, several animal and plant species could no longer survive in the lake. Management addressed the question of whether and how to act.

Eventually, an analysis of pollutant levels using digital technologies was ordered. The results showed that the concentration of environmentally harmful substances remains just below the legally permitted maximum levels in the long term. Nevertheless, new manufacturing processes were implemented using digital technologies. Water pollution now remains significantly below the legally permitted maximum levels in the long term. The biodiversity in the lake has increased again since then.

Appendix C-III: All Variants of Vignettes for Scenario 2 (Risk-Based)

Control Vignette <u>Company A</u> produces a highly demanded and successful product. The manufacturing process uses non-digital technical equipment that consumes large amounts of energy. Therefore, the company operates a company-owned power plant. This generates energy by burning brown coal. This process produces high levels of greenhouse gases that harm the climate and environment. Management consulted on how to address this issue. Initially, the measurement of greenhouse gas emissions was ordered. The results showed that while a very large amount of greenhouse gases is produced, the legal requirements and maximum limits are met in the long term, albeit closely. The energy-intensive machines therefore continue to be operated.
CSR Vignette <u>Company B</u> produces a highly demanded and successful product. The manufacturing process uses non-digital technical equipment that consumes large amounts of energy. Therefore, the company operates a company-owned power plant. This generates energy by burning brown coal. This process produces high levels of greenhouse gases that harm the climate and environment. Measurements initiated by management showed that while a very large amount of greenhouse gases is produced, the legal requirements and maximum limits are met in the long term, albeit closely. Nevertheless, management initiated a gradual transition to renewable energy. Through this transition, the energy-intensive machines can continue to operate while greenhouse gas emissions now remain significantly below the legally prescribed maximum limits.

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Digitalization Vignette

Company B produces a highly demanded and successful product. The manufacturing process uses digital technical equipment that consumes large amounts of energy. Therefore, the company operates a company-owned power plant. This generates energy by burning brown coal. This process produces high levels of greenhouse gases that harm the climate and environment.

Management consulted on how to address this issue. Initially, the measurement of greenhouse gas emissions was ordered. The results showed that while a very large amount of greenhouse gases is produced, the legal requirements and maximum limits are met in the long term, albeit closely. The energy-intensive digital equipment therefore continues to be operated.

CDR Vignette

Company B produces a highly demanded and successful product. The manufacturing process uses digital technical equipment that consumes large amounts of energy. Therefore, the company operates a company-owned power plant. This generates energy by burning brown coal. This process produces high levels of greenhouse gases that harm the climate and environment.

Measurements initiated by management showed that while a very large amount of greenhouse gases is produced, the legal requirements and maximum limits are met in the long term, albeit closely. Nevertheless, management initiated a gradual transition to renewable energy. Through this transition, the energy-intensive digital equipment can continue to operate while greenhouse gas emissions now remain significantly below the legally prescribed maximum limits.

Appendix C-IV: All Variants of Vignettes for Scenario 3 (Opportunity-Based)

Control Vignette

Company 3 produces a highly demanded and successful product. As many positions for skilled employees are vacant, the existing staff regularly have to take on very difficult and exhausting work to a greater extent in order to meet delivery deadlines. The skilled employees therefore suffer from great physical strain. The management therefore decided to conduct a legal review of the existing working conditions. The result was that the great physical strain on the skilled employees still met the minimum requirements of the legal occupational health and safety regulations. No further initiatives were initiated due to compliance with legal requirements. The physical strain on specialist staff has remained unchanged.

CSR Vignette

Company 4 produces a highly demanded and successful product. As many positions for skilled employees are vacant, the existing staff regularly have to take on very difficult and exhausting work to a greater extent in order to meet delivery deadlines. The skilled employees therefore suffer from great physical strain. The management therefore decided to conduct a legal review of the existing working conditions. The result was that the great physical strain on the skilled employees still met the minimum requirements of the legal occupational health and safety regulations. Nevertheless, highly efficient ergonomic equipment was purchased. This has significantly reduced the heavy physical strain of the skilled employees. The minimum requirements of the legal occupational health and safety regulations are far exceeded.

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Digitalization Vignette

Company 4 produces a highly demanded and successful product. As many positions for skilled employees are vacant, the existing staff regularly have to take on very difficult and exhausting work to a greater extent in order to meet delivery deadlines. The skilled employees therefore suffer from great physical strain. The management therefore decided to conduct a legal review of the existing working conditions. The result was that the great physical strain on the skilled employees still met the minimum requirements of the legal occupational health and safety regulations.

In addition, highly efficient software packages were purchased to optimize processes. No further initiatives were introduced. The physical strain has remained unchanged.

CDR Vignette

Company 4 produces a highly demanded and successful product. As many positions for skilled employees are vacant, the existing staff regularly have to take on very difficult and exhausting work to a greater extent in order to meet delivery deadlines. The skilled employees therefore suffer from great physical strain. The management therefore decided to conduct a legal review of the existing working conditions. The result was that the great physical strain on the skilled employees still met the minimum requirements of the legal occupational health and safety regulations.

Nevertheless, highly efficient software packages were purchased to optimize processes. This has significantly reduced the heavy physical strain on the skilled employees. The minimum requirements of the legal occupational health and safety regulations are far exceeded.

Appendix C-V: All Variants of Vignettes for Scenario 4 (Risk-Based)

Control Vignette

Company C produces a highly demanded and successful product. Its production requires the use of technically sophisticated machinery, for which the staff needs new and more comprehensive expertise. Many employees struggle to build this knowledge and feel left behind. Those who possess the expertise are heavily burdened as they try to compensate for the shortage. Therefore, management has ordered an assessment of the situation and the expertise of all employees regarding the technically sophisticated machines. The result showed that the tasks are being very well fulfilled through the balance between staff with and without expertise. The high additional burden on the specialized staff still meets the minimum requirements of legal occupational safety regulations.

Based on this, no further initiatives were decided upon. The burden on the specialized staff remains unchanged.

CSR Vignette

Company D produces a highly demanded and successful product. Its production requires the use of technically sophisticated machinery, for which the staff needs new and more comprehensive expertise. Many employees struggle to build this knowledge and feel left behind. Those who possess the expertise are heavily burdened as they try to compensate for the shortage. Therefore, management has ordered an assessment of the situation and the expertise of all employees regarding the technically sophisticated machines. The result showed that the tasks are being very well fulfilled through the balance between staff with and without expertise. The high additional burden on the specialized staff still meets the minimum requirements of legal occupational safety regulations.

Nevertheless, employees who no longer met the requirements were further trained in effective courses. This significantly reduced the burden on the specialized staff. The legal minimum requirements for occupational safety are far exceeded.

(continued on next page)

Digitalization Vignette

Company D produces a highly demanded and successful product. Its production requires the use of technically sophisticated digital technologies, for which the staff needs new and more comprehensive expertise. Many employees struggle to build this knowledge and feel left behind. Those who possess the expertise are heavily burdened as they try to compensate for the shortage. Therefore, management has ordered an assessment of the situation and the expertise of all employees regarding the technically sophisticated digital technologies. The result showed that the tasks are being very well fulfilled through the balance between staff with and without expertise. The high additional burden on the specialized staff still meets the minimum requirements of legal occupational safety regulations.

Based on this, no further initiatives were decided upon. The burden on the specialized staff remains unchanged.

CDR Vignette

Company D produces a highly demanded and successful product. Its production requires the use of technically sophisticated digital technologies, for which the staff needs new and more comprehensive expertise. Many employees struggle to build this knowledge and feel left behind. Those who possess the expertise are heavily burdened as they try to compensate for the shortage. Therefore, management has ordered an assessment of the situation and the expertise of all employees regarding the technically sophisticated digital technologies. The result showed that the tasks are being very well fulfilled through the balance between staff with and without expertise. The high additional burden on the specialized staff still meets the minimum requirements of legal occupational safety regulations.

Nevertheless, employees who no longer met the requirements were further trained in effective courses. This significantly reduced the burden on the specialized staff. The legal minimum requirements for occupational safety are far exceeded.

D Between Handprints and Footprints: Controlling Decision-Making in Corporate Digital Responsibility

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Between Handprints and Footprints: Controlling Decision-Making in Corporate Digital Responsibility

Abstract

This study examines managerial decision-making in Corporate Digital Responsibility (CDR), addressing how organizations navigate the ethical and economic challenges of digitalization. Integrating Rest's (1986) four-component model with Ajzen's (1991) theory of planned behavior, we surveyed 187 German managers to identify factors influencing CDR implementation. Our findings reveal that treating CDR as a unified construct masks critical differences in decision-making patterns. When analyzed as pooled data, perceived behavioral control emerges as the sole significant predictor of implementation intentions. However, exploratory analysis differentiating between opportunity-based CDR (leveraging technology to create positive societal "handprints") and risk-based CDR (mitigating negative digital "footprints" like privacy violations) uncovers distinct decision-making logics. Risk-based CDR decisions are driven primarily by economic evaluations (attitude), reflecting compliance-oriented thinking, whereas opportunity-based CDR depends on organizational capabilities (perceived behavioral control) and marginally on stakeholder expectations (subjective norm). Across all models, ethical considerations fail to predict implementation intentions, indicating that CDR adoption is driven by pragmatic rather than moral factors. The consistently strong intention-action relationship confirms that intention formation remains the critical gateway to actual implementation, requiring differentiated strategies for different CDR types.

Keywords: Corporate Digital Responsibility, CDR, CSR, Managerial Decision-Making, Ethical Decision-Making, Theory of Planned Behavior

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JEL Classification: M14, D91, D81, O33

1 Introduction

In April 2021, Apple faced a defining Corporate Digital Responsibility (CDR) decision. The tech giant implemented its App Tracking Transparency (“ATT”) framework, requiring iPhone apps to obtain explicit user consent before tracking their data for advertising purposes. This single managerial decision – prioritizing user privacy over advertising revenues – triggered immediate financial consequences: Snap’s stock crashed by 25% after reporting ATT-related revenue losses, while Facebook (now Meta) estimated a loss of over \$10 billion in annual revenue (Dang and Balu, 2021; Leswing, 2022). Apple’s management had to weigh competing values: user privacy rights against business partner revenues, ethical principles against economic consequences, and long-term trust against short-term profits. While Apple framed the decision as empowering users with choice – a narrative that aligns with principles of CDR –, critics argued it was anti-competitive, with French regulators ultimately fining Apple €150 million for implementation practices that allegedly favored its own advertising business (Autorité de la concurrence, 2025). The ATT case reveals how CDR decisions involve balancing innovation benefits, ethical imperatives, and stakeholder impacts without clear precedents or guidelines (Hartley *et al.*, 2024).

The Apple ATT case is not an isolated example. Across industries, organizations increasingly face similar digital responsibility dilemmas as they navigate the intersection of technology, ethics, and business imperatives. CDR builds upon Corporate Social Responsibility (CSR) foundations to encompass digital dimensions. While CSR has long guided companies in managing their environmental and social impacts, CDR specifically addresses the unique challenges of digitalization – from data ethics and algorithmic fairness to digital inclusion and cybersecurity (Lobschat *et al.*, 2021; Mueller, 2022). Beyond defensive initiatives like Apple’s privacy controls, CDR also encompasses proactive initiatives to leverage technology for societal benefit (Cardinali and De Giovanni, 2022). This dual nature reflects two distinct approaches: risk-based CDR focuses on minimizing negative “footprints” – the potential harms and risks that digital technologies can create, such as data breaches, algorithmic discrimination, or electronic waste. In contrast, opportunity-based CDR emphasizes creating positive “handprints” – actively using digital capabilities to address societal challenges, promote inclusion, or advance sustainability. This footprint-handprint distinction suggests that CDR may not be a monolithic construct but

rather encompass different types of initiatives that managers might approach through fundamentally different decision-making logics.

Implementing CDR presents complex challenges. Unlike traditional compliance with clear standards, digital responsibility requires navigating ambiguous terrain where ethical imperatives, business objectives, and stakeholder expectations collide (Hartley *et al.*, 2024; Kunz and Wirtz, 2024). Elliott and Copilah-Ali (2024) characterize CDR challenges as “wicked problems” – complex problems with no definitive solution, encompassing multiple unknown influences and outcomes as well as actors with unpredictable behaviors and interests. The “CDR calculus” involves continuously weighing innovation benefits against ethical risks and resource investments (Hartley *et al.*, 2024), often without established guidelines or precedents (Carl *et al.*, 2024; Wirtz *et al.*, 2023). Despite this critical recognition of CDR’s complexity, a significant gap remains in the micro-level understanding of how CDR translates from abstract corporate policy into actionable managerial decisions. Current empirical literature largely focuses on macro-level determinants, such as institutional drivers (Vo Thai *et al.*, 2024; Trittin-Ulbrich and Böckel, 2022) and stakeholder perceptions (Carl *et al.*, 2024), or outcome measurements, such as economic performance or reputational effects (Oduro *et al.*, 2024; Vo Thai *et al.*, 2024). What is missing is a systematic investigation into the cognitive and behavioral drivers that influence the individual manager tasked with implementing CDR. While organizations increasingly recognize the importance of responsible digitalization, their actual implementation varies dramatically. Some companies embrace comprehensive programs, others adopt selective initiatives, and many struggle to translate awareness into action. This variation in corporate responses suggests that substantial decisive factors reside within the managerial decision-making process itself – a “black box” that remains insufficiently explored by current research.

Understanding the individual calculus of the manager is crucial because it addresses the implementation deficit. Without knowing which factors (e.g., economic rationale, ethical conviction, or perceived control) actually drive the intention to act, theory cannot fully explain variations in CDR performance and practice cannot design effective levers (like training or incentives) to promote responsible digitalization.

This leads to our central research question, which seeks to unpack this black box: What factors influence managerial decision-making regarding CDR initiatives? To understand

these decision-making dynamics, we integrate two theoretical frameworks. Rest's (1986) four-component model of ethical decision-making illuminates how managers recognize and evaluate moral dimensions of digital issues. Ajzen's (1991) theory of planned behavior explains how attitudes, social influences, and perceived capabilities translate into implementation decisions. This synthesis captures both the ethical reasoning and practical considerations shaping CDR adoption.

Our survey-based analysis of 187 German managers examines how managerial decision-making in CDR varies depending on the type of digital responsibility initiative. The sample predominantly consisted of executives and senior managers, most of whom worked in small and medium-sized enterprises. The participants represented a broad range of industries, including services, trading, and manufacturing, ensuring diverse sectoral perspectives.

When examining CDR as a unified construct, we find that managers' perceived ability to implement initiatives serves as the sole significant predictor of implementation intentions. However, this aggregated view masks critical distinctions. Our exploratory analysis differentiating between opportunity-based and risk-based CDR reveals two distinct decision-making logics: managers approach risk-based CDR through economic lenses, emphasizing cost-benefit analyses and compliance considerations, whereas opportunity-based CDR depends primarily on perceived organizational capabilities and resources, with stakeholder expectations playing a secondary role. Notably, ethical considerations fail to predict implementation intentions across all models – a finding that challenges established assumptions about ethical reasoning in corporate contexts. The consistently strong relationship between intention and implementation across all models confirms that intention formation remains the critical gateway to actual CDR implementation, regardless of initiative type.

This study advances both theory and practice in three ways. First, it integrates Rest's (1986) four-component model with Ajzen's (1991) theory of planned behavior, revealing the necessity of accounting for both ethical reasoning and economic-resource constraints in CDR contexts. Second, it empirically establishes that CDR encompasses diverse initiatives approached through different managerial logics: risk-based CDR follows an exploitation logic driven by economic evaluation, while opportunity-based CDR follows an exploration logic driven by organizational capabilities. Third, by uncovering these

distinct mechanisms, it provides concrete insights for designing differentiated management control systems – risk-based CDR requires control systems emphasizing financial metrics and compliance tracking, while opportunity-based CDR requires systems focused on capability development and stakeholder engagement.

The remainder of this paper is structured as follows: Section 2 develops our integrated theoretical framework. Section 3 presents our research hypotheses. Section 4 describes the methodology and research design. Section 5 reports the main empirical results. Section 6 presents an exploratory supplemental analysis examining the dual nature of CDR. Section 7 discusses our findings and derives implications and limitations. Section 8 concludes the paper.

2 Theoretical Framework

2.1 The Need for an Integrated Model of Ethical Decision-Making in CDR

Research on ethical decision-making in business contexts has developed several valuable theoretical frameworks, including cognitive-moral models such as Rest's (1986) four-component model, which focuses on the psychological stages of moral decision-making, and behavioral prediction frameworks like Ajzen's (1991) theory of planned behavior, which focuses on explaining the intention to perform a behavior based on social and rational factors (Craft, 2013; Lehnert *et al.*, 2015; O'Fallon and Butterfield, 2005; Owusu and Korankye, 2023).

The complex nature of CDR decisions necessitates an integrated theoretical foundation that neither framework alone can provide. This necessity stems from inherent limitations in how the existing models address the unique challenges of CDR.

Rest's (1986) four-component model is excellent for dissecting the moral reasoning process, particularly the stage of moral judgment (determining what is right). However, CDR requires more than mere moral evaluation; it demands actionable implementation within an organization. Consequently, the four-component model proves less effective at explaining the ultimate behavioral intention and its practical execution, especially when ethical imperatives often compete with financial objectives and where implementation requires specialized resources and capabilities – a reality central to CDR (Hartley *et al.*, 2024; Lobschat *et al.*, 2021). Conversely, Ajzen's (1991) theory of planned behavior is

well-suited for modeling managerial decision-making concerning resource allocation and implementation, as it effectively predicts intention based on factors like attitude, social norms, and perceived control. However, CDR is an inherently morally charged topic and the theory of planned behavior lacks a dedicated ethical dimension capable of capturing the fundamental moral conviction that can drive responsible digitalization.

To fully capture the complexity of the CDR decision-making process we thus develop an integrated theoretical framework. Our approach synthesizes the crucial moral judgment component from Rest's (1986) four-component model with Ajzen's (1991) theory of planned behavior, thereby ensuring that the ethical aspect of CDR is explicitly modeled as a direct antecedent of intention, thereby providing a more nuanced understanding of how managers form and act upon intentions related to CDR implementation in organizational contexts.

2.2 Theoretical Foundations

Rest's Four-Component Model of Ethical Decision-Making

Rest's (1986) model conceptualizes ethical decision-making as a process involving four distinct psychological components: moral awareness, moral judgment, moral intention, and moral action. Moral awareness involves recognizing the ethical dimensions of a situation. Moral judgment refers to the evaluation of potential actions based on ethical principles and values. Moral intention captures the commitment to prioritize ethical values over competing considerations (Lehnert *et al.*, 2015). Finally, moral action represents the execution of the ethical decision (Rest, 1986).

For the purpose of our analysis, we do not include moral awareness as a predictor, focusing instead on the direct antecedents of managerial intention. This is a strategic decision in the research design. Theoretically, our primary goal is to explain the formation and structure of implementation intent, making the immediate drivers the central focus. Methodologically, achieving a robust and valid assessment of context-specific moral awareness – which typically requires complex, time-intensive scenario-based qualitative or experimental methods – was infeasible within the constraints of a large-scale survey targeting a management sample. Our decision to focus on the subsequent stages of the decision process ensures the analytical rigor and specific feasibility required to test the integrated model within the scope of this empirical investigation. This approach aligns with prior

research that has strategically modified Rest's model according to specific analytical needs (Craft, 2013; Lehnert *et al.*, 2015; O'Fallon and Butterfield, 2005; Owusu and Korankye, 2023).

Despite its comprehensive nature, Rest's model presents certain limitations when applied to organizational decision-making. It primarily focuses on individual moral reasoning processes but offers less insight into how social influences and practical constraints affect the translation of ethical judgments into action. Additionally, it does not explicitly address how decision-makers balance ethical considerations against other legitimate organizational objectives, such as financial performance – a critical aspect of CDR decision-making (Wirtz *et al.*, 2023).

Ajzen's Theory of Planned Behavior

Ajzen's (1991) theory of planned behavior provides a broad framework for analyzing behavior by examining the role of attitudes, social pressures, and perceived control in forming intentions that ultimately drive conduct. Originally developed as an extension of the theory of reasoned action (Fishbein and Ajzen, 1975), the theory of planned behavior has subsequently found application in diverse behavioral contexts and can provide a complementary framework for analyzing ethical behavior as well (e.g., Al-Rafee and Cronan, 2006; Chang, 1998; Dubinsky and Loken, 1989; Feder and Weißenberger, 2019; Randall and Gibson, 1991).

Similar to the four-component model by Rest (1986), the theory of planned behavior establishes a connection between intention and behavior. Intention, however, is predicted based on three determinants: the attitude toward the behavior, the subjective norm, and the perceived behavioral control (Ajzen, 1991). Attitude reflects an individual's overall evaluation of performing the behavior as well as its believed consequences (Ajzen, 1991; Dawkins *et al.*, 2016; Dubinsky and Loken, 1989). The subjective norm captures individuals' perceptions of social pressure from significant others to perform the behavior (Ajzen, 1991; Dawkins *et al.*, 2016; Dubinsky and Loken, 1989). Finally, perceived behavioral control represents an individual's assessment of their ability to perform the behavior, considering both internal capabilities and external constraints (Ajzen, 1991).

While the theory of planned behavior offers valuable insights into how cognitive, social and nonvolitional factors shape intentions, it has limitations in ethical contexts. Particularly, it does not distinguish between ethical and non-ethical aspects of attitude,

which seems crucial in CDR contexts where economic and ethical considerations may diverge.

2.3 The Integrated Model for CDR Decision-Making

In our integrated model, we retain the core components of the theory of planned behavior (attitude, subjective norm, perceived behavioral control, intention, and behavior) while adding judgment as a distinct construct. This approach enables us to examine how ethical evaluations interact with economic considerations, stakeholder expectations, and implementation capabilities in shaping CDR decisions.

Judgment and Attitude: Distinction and Relationship

The most important conceptual clarification in our integrated model concerns the relationship between judgment and attitude.

In the context of ethical decision-making, the attitude component of the theory of planned behavior can be partly viewed as an outcome of judgment as articulated in Rest's model (Rest *et al.*, 1997; Thoma *et al.*, 1986). When individuals assess an action as ethically correct, they are likely to cultivate a positive attitude toward it. However, while incorporating the outcome of judgment, attitude represents an overall evaluation of an action (Dawkins *et al.*, 2016). This means it also encompasses other – potentially competing – values, which may lead to discrepancies between the two constructs that should therefore be considered separately (Al-Rafee and Cronan, 2006).

In our integrated model, judgment represents the purely ethical evaluation of CDR initiatives, focusing on whether implementing them is morally appropriate based on ethical principles and values. Attitude, in contrast, captures a broader evaluation that emphasizes the economic and business implications of CDR initiatives, such as their impact on financial performance and competitive position. This distinction is particularly valuable in the CDR context, where managers must navigate what Hartley *et al.* (2024) and Wirtz *et al.* (2023) describe as the “CDR calculus” – the complex weighing of expected benefits and costs.

The Role of Social Influence: Subjective Norm

The subjective norm construct from Ajzen's theory of planned behavior addresses a dimension not explicitly captured in Rest's model: how perceived expectations from significant stakeholders influence intentions. In the CDR context, these expectations can

come from various sources, including regulatory bodies, customers, employees, and investors (Lobschat *et al.*, 2021; Oduro *et al.*, 2024).

Following the four-component model, these expectations represent additional variables that can either support an individual in choosing a moral action or present competing goals, i.e., shaping intentions and ultimately impacting ethical behavior (Ferrell and Gresham, 1985; Lehnert *et al.*, 2015; Loe *et al.*, 2000; Treviño, 1992). While Rest's model therefore acknowledges that social factors can influence moral decision-making, it does not offer a specific construct for measuring these influences. This addition is particularly valuable in the CDR context, where stakeholder expectations are often diverse and sometimes contradictory. For example, customers may simultaneously demand personalized services and enhanced data privacy (Hartley *et al.*, 2024), creating tension in how managers respond to stakeholder expectations.

Addressing Implementation Challenges: Perceived Behavioral Control

The perceived behavioral control construct represents another important complementary addition from Ajzen's theory. It is not directly related to the four-component model but can influence the implementation of ethical decisions by reflecting the perceived capabilities and resources available to do so. To account for these nonvolitional aspects of decision-making, Ajzen (1991) introduced perceived behavioral control as an extension to the theory of reasoned action (Fishbein and Ajzen, 1975). While individuals may form moral intentions based on moral awareness and judgment, their intention to execute the action can be impaired by perceived limitations or conditions that are only partially under the individual's control (Chang, 1998). This addition is significant when studying CDR implementation, which often requires specialized knowledge, organizational resources, and cross-functional coordination (Carl *et al.*, 2024; Herden *et al.*, 2021).

This integrated framework (visualized in Figure D-1) thus provides a comprehensive foundation for examining CDR decision-making that accounts for ethical reasoning, economic evaluation, social influences, and implementation constraints – factors that individual theories address only partially.

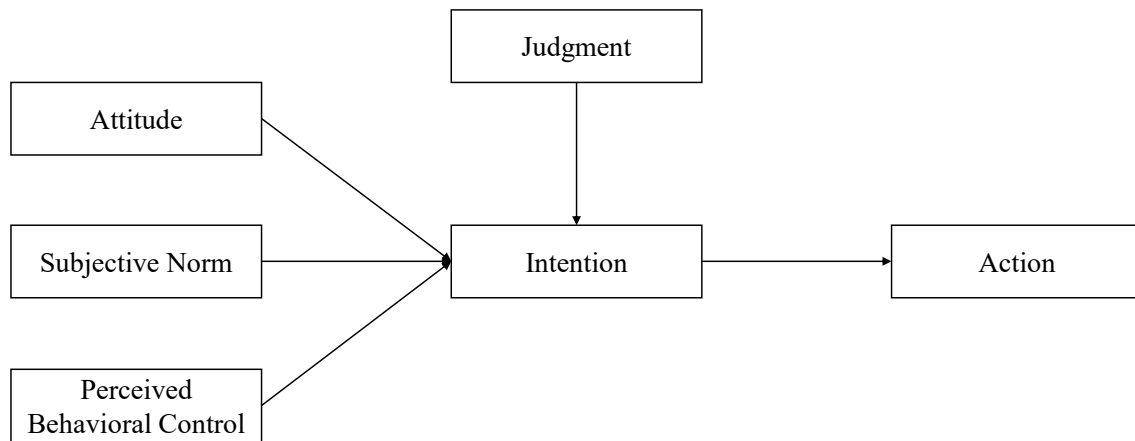


Figure D-1: Integrated Theoretical Model for CDR Decision-Making (adapted from Rest, 1986, and Ajzen, 1991)

3 Hypotheses Development

The Impact of Judgment on Intention

Building on our integrated model, we first examine how ethical judgment influences managerial intention to implement CDR initiatives. Disregarding other factors, it appears logically plausible that individuals generally strive to behave morally. This can be theoretically described through the self-determination theory from psychological literature (Deci and Ryan, 1985, 2000). According to the theory, people seek to make decisions that align with their fundamental needs for autonomy, competence, and (social) relatedness to grow, develop, and self-actualize. This implies that individuals are more motivated to perform behaviors when they feel their actions align with their personal values and beliefs (Ryan and Deci, 2002; Gagné and Deci, 2005).

This corresponds to the concept of moral identity (Blasi, 1984; Aquino and Reed, 2002), which posits that individuals strive to translate their moral beliefs into actions to maintain self-consistency. We hypothesize that this assumption also applies to CDR initiatives, as they, like CSR, address socially positively connoted values such as privacy, inclusion, or environmental protection in the digital context.

Therefore, we propose:

***H₁:** Managers' moral judgment of CDR initiatives has a positive effect on their intention to implement them.*

The Impact of Attitude on Intention

While judgment represents the purely ethical evaluation of CDR initiatives, attitude in our integrated model encompasses a broader assessment that explicitly includes economic considerations. The implementation of sustainable strategies, including CDR, requires managers to balance competing objectives. In the context of CDR, firms often face conflicts between corporate objectives and responsible digitalization (Hartley *et al.*, 2024; Kunz and Wirtz, 2024; Wirtz *et al.*, 2023). This tension is captured by the “CDR calculus”, where firms weigh the benefits and costs of CDR (Hartley *et al.*, 2024; Wirtz *et al.*, 2023). The financial value of CDR, according to Wirtz *et al.* (2023), comprises three components: opportunity costs, actual costs, and potential benefits. These benefits include risk reduction and the creation of brand equity and trust. For example, a strong CDR culture has the potential to enhance customer satisfaction, trust, and loyalty, while also improving a firm’s reputation, mirroring effects observed in CSR contexts (Lobschat *et al.*, 2021; Saeidi *et al.*, 2015; Stanaland *et al.*, 2011).

However, the implementation of CDR poses challenges. The immediate financial profitability of CDR is often not evident, with returns potentially materializing only in the long term (Hartley *et al.*, 2024; Lobschat *et al.*, 2021; Oduro *et al.*, 2024). This issue is compounded by the abstract nature of CDR expectations and goals, which are more difficult to grasp, define, and measure compared to traditional business metrics (Lobschat *et al.*, 2021; Mueller, 2022). This directly challenges managerial motivation. The lack of clear, short-term payoffs and measurable targets can undermine intrinsic motivation (e.g., satisfaction derived from “doing good” or task completion itself). Simultaneously, the difficulty in defining and measuring CDR goals complicates its integration into existing incentive systems, thereby reducing extrinsic motivation (i.e., rewards tied to performance). Specifically, if CDR initiatives appear to compete with incentivized goals or are not perceived as profitable, the motivation for implementation is further reduced (Wirtz *et al.*, 2023). Additionally, the implementation of CDR can incur substantial costs for organizations, particularly in the short term (Carl *et al.*, 2024; Lobschat *et al.*, 2021; Oduro *et al.*, 2024).

Given the prominence of economic considerations in managerial decision-making (Wirtz *et al.*, 2023), we expect that managers who perceive CDR initiatives as economically relevant will be more inclined to implement them.

These considerations lead to the following hypothesis:

***H₂:** Managers' attitude towards CDR initiatives has a positive effect on their intention to implement them.*

Impact of Subjective Norm on Intention

The third component of our integrated model addresses how social pressures influence CDR implementation intentions. Digital technologies are characterized by their dynamic and often opaque nature, raising questions about the applicability of generally accepted norms and values to digital activities (Lobschat *et al.*, 2021). The heterogeneous goals of stakeholders regarding CDR further compound this difficulty (Carl *et al.*, 2024; Mueller, 2022). These goals can vary significantly not only between different stakeholder groups but also within subgroups (Oduro *et al.*, 2024; Preston and Sapienza, 1990). For instance, customers may demand personalized and fast services while simultaneously prioritizing data minimization and full control over their data (Hartley *et al.*, 2024). This ambivalence in stakeholder expectations creates a challenging environment for managers seeking normative guidance (Lobschat *et al.*, 2021). Additionally, normative influences from regulatory requirements, such as ethical AI guidelines, set baseline expectations for responsible digital practices, and competitive pressures from peer organizations establish industry benchmarks that managers must consider (Schrödter and Weißenberger, 2024). These external factors add another layer of complexity to the normative environment in which CDR decisions are made.

Rest's (1984) framework emphasizes the importance of establishing social agreements based on reciprocity, where all parties benefit from collaboration. However, in the context of CDR, the inherent complexity and lack of transparency, as well as ambivalent stakeholder expectations regarding digital technologies, can impede managers' ability to fully comprehend and align with these social agreements, which further complicates their normative orientation and decision-making processes.

Despite these challenges, it is reasonable to posit that normative expectations play a crucial role in shaping managers' intentions to implement CDR initiatives. The theory of planned behavior (Ajzen, 1991) supports this notion, suggesting that subjective norm – which include perceived stakeholder expectations – are a key determinant of behavioral intentions. Moreover, stakeholder theory (Freeman, 1984) stresses the importance of

firms considering the interests of all stakeholders in their decision-making processes. In the context of CDR, this would imply that managers' perceptions of stakeholder expectations regarding digital responsibility should influence their intentions to implement related initiatives.

We thus propose the following hypothesis:

***H₃:** Managers' subjective norm regarding CDR initiatives positively influences their intention to implement them.*

Impact of Perceived Behavioral Control on Intention

The theory of planned behavior posits that perceived behavioral control is a key determinant of behavioral intentions (Ajzen, 1991). In the context of CDR, it refers to managers' perceptions of their ability to implement CDR initiatives, considering factors such as the availability of resources, technical knowledge, and organizational support.

CDR initiatives often require complex and resource-intensive processes (Elliott and Copilah-Ali, 2024), particularly when addressing the challenges posed by dynamic and opaque digital technologies (Carl *et al.*, 2024; Lobschat *et al.*, 2021). This complexity stems from several factors, including the rapidly evolving technologies (Hartley *et al.*, 2024; Herden *et al.*, 2021), limited guidance from regulatory standards (Carl *et al.*, 2024; Oduro *et al.*, 2024), and the need for specialized technical expertise to identify and address potential risks such as AI discrimination or data misuse (Carl *et al.*, 2024; Herden *et al.*, 2021; Mueller, 2022). The implementation of CDR initiatives may also require significant financial investment and organizational changes, such as establishing competent cross-functional teams, integrating new data governance frameworks, or reconfiguring existing technological infrastructures (Hartley *et al.*, 2024; Sidaoui *et al.*, 2024; Wirtz *et al.*, 2023).

Drawing on the theory of planned behavior, it can be argued that managers are more likely to feel motivated to implement CDR initiatives when they perceive they have adequate control over these factors.

Based on these considerations, we propose the following hypothesis:

***H₄:** Managers' perceived behavioral control over CDR initiatives positively influences their intention to implement them.*

Impact of Intention on Action

The final relationship in our integrated model examines the translation of CDR intentions into actual implementation. The critical role of intention as a precursor to action is underscored by both the theory of planned behavior (Ajzen, 1991) and Rest's four-component model (1986). While the theory of planned behavior identifies intention as the immediate antecedent of behavior, the four-component model situates intention within a broader ethical decision-making process, highlighting its moral underpinnings. In our integrated framework, managers' intention to implement CDR initiatives reflects both their ethical commitment and readiness to act on this commitment.

Drawing on the theoretical foundations, we argue that managers' intentions should strongly predict their actual implementation of CDR initiatives. However, translating intention into action in the CDR context is particularly challenging due to the inherent complexity of digital technologies and the diversity of CDR initiatives (Carl *et al.*, 2024; Lob-schat *et al.*, 2021), creating a difficult environment in both the digitalization and sustainability spheres (Elliott and Copilah-Ali, 2024). Furthermore, implementing CDR initiatives often demands substantial resources, including financial investment, technical expertise, and organizational restructuring, as described above (Sidaoui *et al.*, 2024; Wirtz *et al.*, 2023). Such requirements can create significant barriers that impair the formation of behavioral intentions and hinder their realization, even when managers have strong motivations to implement CDR initiatives. Despite these implementation barriers, we expect intention to remain a key driver for the implementation of CDR initiatives consistent with the robust intention-behavior relationship established in the theory of planned behavior literature.

We thus propose the following hypothesis:

***H₅:** Managers' intention to implement CDR initiatives positively influences their actual implementation.*

On the Specificity of CDR Decision-Making

The theoretical framework and hypotheses developed above draw on established behavioral theories – Rest's (1986) four-component model and Ajzen's (1991) theory of planned behavior – that were originally conceptualized for ethical and behavioral decisions broadly, not exclusively for digital responsibility contexts. This raises an important

question: Are the hypothesized relationships specific to CDR, or might they equally apply to traditional CSR decision-making?

We argue that while the fundamental psychological mechanisms are indeed universal, the digital transformation context creates distinctive boundary conditions that make these mechanisms particularly salient and potentially operate differently in CDR versus traditional CSR settings. Three key distinctions emerge:

First, the calculus of economic evaluation (attitude) operates under fundamentally different constraints in CDR contexts. Digital technologies evolve at exponential rates (Moore, 1965; Lobschat *et al.*, 2021), compressing timelines and amplifying uncertainty about long-term costs and returns in ways that exceeds the already-challenging business case calculations in traditional CSR (Hartley *et al.*, 2024; Wirtz *et al.*, 2023). When a sustainability initiative's returns may materialize over years, managers can draw on established frameworks and benchmarks; when an AI ethics decision's implications may be obsolete within months due to technological advancement, economic assessments become profoundly more speculative and disputed.

Second, the role of organizational capability (perceived behavioral control) takes on heightened importance because digital responsibility demands highly specialized, technical competencies that differ categorically from traditional CSR implementation skills. Whereas environmental or social CSR initiatives build on established organizational functions and widely available expertise, CDR initiatives require progressive digital literacy, interdisciplinary coordination between technical and ethical domains, and navigation of complex socio-technical systems (Carl *et al.*, 2024; Herden *et al.*, 2021). This technical barrier makes capability assessments more determinative of implementation intentions than in traditional CSR.

Third, normative pressures (subjective norm) operate in a less institutionalized landscape. While traditional CSR domains benefit from decades of norm crystallization through frameworks like GRI or ISO standards, digital responsibility norms remain emergent and contested (Carl *et al.*, 2024; Mueller, 2022). Stakeholder expectations around algorithmic fairness, data minimization beyond legal requirements, or digital inclusion are neither uniform nor stable, potentially weakening or fragmenting the social pressures that guide manager decisions compared to well-established CSR issues.

Thus, our hypotheses, while building on general behavioral theory, are theoretically grounded in the proposition that digital transformation's unique characteristics create a decision environment where the balance and interaction of judgment, attitude, subjective norm, and perceived behavioral control may differ substantially from traditional CSR contexts.

4 Methodology and Research Design

4.1 Data Collection and Sample

The data for this study were collected through telephone surveys conducted with managers from German companies located in the federal state of North Rhine-Westphalia. We chose telephone interviewing as our data collection method for several strategic reasons. First, telephone surveys provide superior access to senior management compared to online questionnaires, as they enable direct, personalized contact with decision-makers who are otherwise difficult to reach (Block and Erskine, 2012). Second, the interactive nature of telephone interviews allows for real-time clarification of complex questions and ensures higher data quality through interviewer monitoring. While this approach is more resource-intensive than online surveys, it was essential for our research objectives, which required respondents with strategic decision-making authority and comprehensive organizational oversight.

Company addresses were sourced exclusively from publicly available databases, including the German commercial register, the Federal Gazette, and the register portals of the federal states. The finance and real estate industries were deliberately excluded. The telephone interviews were conducted by a professional survey agency. When contacting companies, interviewers requested to speak with senior management, typically the managing director or a member of the executive team, to ensure respondents held sufficient strategic overview to evaluate CDR initiatives meaningfully. This sampling approach is particularly appropriate for our focus on small and medium-sized enterprises (92.5% of our final sample comprises firms with fewer than 250 employees), where senior management typically maintains comprehensive oversight of strategic initiatives including digitalization and sustainability.

In total, 1,208 companies were initially contacted. Out of these, 718 were successfully reached, and 190 completed the survey, resulting in a response rate of 15.73%, a cooperation rate of 26.46%, and a contact rate of 59.44%. During data cleaning, three observations were removed due to out-of-scope industries (e.g., public administration, insurance), resulting in a final sample of 187 observations. The sample composition confirms the effectiveness of our targeted approach to senior management: 77.5% of respondents held positions at the managing director or senior management level, with an additional 13.4% at division manager level and 8.6% at department manager level. The majority of companies are small and medium-sized enterprises, with 59.1% having 10 to 49 employees and 28.0% having 50 to 249 employees. The largest industry categories represented are trading (25.8%), service and consulting (21.5%), and general industry (21.5%), indicating a broad sectoral distribution across digital transformation challenges. Sample characteristics, including the industry of the companies, the number of employees, and the participant's position within the company, are detailed in Table D-1.

Table D-1: Sample Characteristics

	Frequency	Percentage
<i>Position of Participant</i>		
Managing director and senior management level	145	77.5%
Division manager	25	13.4%
Department manager	16	8.6%
Team leader	1	0.5%
<i>Employees in Company</i>		
Under 10	10	5.4%
10-49	110	59.1%
50-249	52	28.0%
Over 249	14	7.5%

(continued on next page)

	Frequency	Percentage
<i>Industry of Company</i>		
Agriculture and Food Industry	9	4.8%
Construction	7	3.8%
Service and Consulting	40	21.5%
Healthcare	5	2.7%
Trading	48	25.8%
Manufacturing	11	5.9%
Hotel, Gastronomy, and Leisure	12	6.5%
IT, Telecommunications, and Media	12	6.5%
Logistics, Transportation	2	1.1%
Industry	40	21.5%

4.2 Variable Measurement

In our survey, we collected comprehensive data on various CDR initiatives to capture the full spectrum of digital responsibility. These initiatives encompassed different aspects of how organizations can address societal challenges through digital technologies – both in terms of creating positive impacts and mitigating potential negative consequences. For the main analysis, all CDR items were pooled to examine general patterns in CDR decision-making.

Each construct employed in our study is conceptually treated as formative. This means that the observed variables are understood to define and cause the latent construct, in contrast to reflective models where the latent variable causes the indicators (Diamantopoulos and Winklhofer, 2001).

This approach is required because the items for all multi-item constructs were specifically chosen to reflect distinct, non-interchangeable aspects of digital responsibility (e.g., environmental, social, and governance-related initiatives), which jointly define the CDR domain. The theoretical justification for this lies in the non-interchangeability of indicators: omitting any one item would mean omitting an entire substantive part of the construct, a defining characteristic of a formative model (Bollen and Lennox, 1991; Diamantopoulos and Winklhofer, 2001).

Consequently, indicators of a formative construct are not necessarily expected to be highly correlated (Bollen and Lennox, 1991). This renders the estimation of internal consistency using measures like Cronbach's alpha – which relies on high positive correlations – inappropriate, as internal consistency is largely irrelevant in this context (Diamantopoulos and Winklhofer, 2001). The fact that all calculated Cronbach's alphas were below the conventional threshold of 0.7 thus statistically supports the theoretical rationale for treating the constructs as formative (Nunnally, 1978).

The corresponding scores were calculated by summing the item responses up. Since the items forming subjective norm were based on different scales, they were standardized before being combined.

Independent Variables

To measure judgment, attitude, and perceived behavioral control, we used various examples of CDR initiatives. These include ESG initiatives related to, e.g., inclusivity, environmental sustainability, and transparency within the digital realm. Since for judgment we did not want to focus on the process of reasoning but rather on its outcome (i.e., “attitude” according to Thoma *et al.*, 1986), we did not measure it using the defining issues test (Rest, 1979). Instead, we directly asked participants: “To what extent do you personally consider the following initiatives to be ethically correct?” for each of eight exemplary CDR initiatives (six-point Likert scale from “Not ethical at all.” to “Completely ethical.”). An example for an initiative is the use of digital technologies for more transparent supply chains and fairness along the value chain. To avoid confusion with the construct of attitude as defined in the theory of planned behavior, we still refer to the attitude resulting from moral judgment as judgment.

For attitude, participants evaluated the same initiatives by answering the question: “How important do you personally consider the following initiatives for the sustainable continuance of companies?” on a six-point Likert scale, ranging from “Not important at all.” to “Extremely important.” (Cordano and Frieze, 2000; Engle *et al.*, 2010; Feder and Weißenberger, 2019). We aimed to include economic considerations here, so we explicitly stated in each example that the initiatives come with additional (short-term) expenses or efforts (Feder and Weißenberger, 2019). For instance, one item was framed as: “Creating transparent supply chains and fairness along the value chain with the help of digital technologies, even if this causes costs.”.

Perceived behavioral control was measured by asking the participants to state their agreement with statements following the question: “How do you assess the following statements?” for each of four exemplary CDR initiatives on a six-point Likert scale from “Strongly disagree.” to “Strongly agree.”. An example item is: “I can implement measures to increase the transparency of the supply chain using digital technologies in my company.” (e.g., Carpenter and Reimers, 2005; Cordano and Frieze, 2000; Feder and Weißenberger, 2019). For a supplemental analysis, we also asked participants to select the primary constraint, if any, to implement each initiative (Feder and Weißenberger, 2019). The participants were able to choose between, e.g., technological know-how, personnel capacity, and financial resources.

Subjective norm was formed using two variables. The first variable measured the breadth of social pressure via the question: “Which of the groups mentioned do you think expect your company to act responsibly and sustainably in the use of digital technologies and data?” (multiple choice; e.g., employees, customers, suppliers). The second measured the intensity of pressure via the statement: „My company is under high pressure from various stakeholders who expect responsible and sustainable action from me regarding digitalization“ (six-point Likert scale from “Strongly disagree.” to “Strongly agree.”). This approach captures both the breadth and intensity of social expectations, similar to the approach by Feder and Weißenberger (2019).

Dependent Variables

The two dependent variables, intention and action, were measured using six different vignettes describing various CDR initiatives. Participants were asked to evaluate each scenario by stating whether they would implement a similar initiative in their company (intention) and whether they had already implemented a comparable initiative (action). An example of a scenario used is a project where digital technologies are implemented to analyze and reduce emissions, even though the initial implementation costs temporarily exceed the cost savings. Both variables were measured on a six-point Likert scale ranging from “Strongly disagree.” to “Strongly agree.” (e.g., Buchan, 2005; Carpenter and Reimers, 2005; Feder and Weißenberger, 2019; Flannery and May, 2000).

Control Variables

To control for secondary but significant effects, we included several variables potentially related to the intended or actual implementation of CDR initiatives as well as their explanatory variables. These include the participants' position within the company, as it directly affects the ability to implement CDR initiatives. Company size, measured by the number of employees, can correlate with stricter legal and societal demands (Lynch-Wood *et al.*, 2009). Since the implementation of CDR initiatives is typically cost-intensive, small and medium-sized enterprises may have less engagement with such initiatives (Hartley *et al.*, 2024; Lobschat *et al.*, 2021). Industry-specific differences are also likely, as exposure, the relationship between CDR and profitability, and regulatory requirements might vary across sectors (Lobschat *et al.*, 2021; Ozdora-Aksak and Atakan-Duman, 2016). Due to the focus on digital technologies, we also controlled for technology acceptance (using items from Venkatesh *et al.*, 2012) to account for effects arising from the attitudes towards digital technologies themselves. Lastly, we accounted for social desirability (using items from Feder and Weißenberger, 2019; based on Winkler *et al.*, 2006; and Paulhus, 1984), as it can introduce biases in the context of ethical decision-making (Lehnert *et al.*, 2015).

4.3 Analytical Approach

To test our integrated model of CDR decision-making, we employed a two-phase analytical strategy using STATA software. In the first phase, we conducted a comprehensive analysis of the pooled data to test our main hypotheses about general patterns in CDR decision-making. The second phase consisted of an exploratory supplemental analysis to investigate whether different types of CDR initiatives exhibit distinct decision-making patterns. We used ordinary least squares (OLS) regression as our primary analytical method.

5 Results

5.1 Descriptive Statistics and Preliminary Analysis

Table D-2 presents the descriptive statistics for our variables. The mean (M) score represents the average total score for the respective construct across all respondents in the sample. The judgment construct can serve as an example. Here, managers evaluated the ethical appropriateness of eight distinct initiatives aimed at creating societal value, such as promoting digital literacy and sharing socially beneficial data, or avoiding digital harm, such as handling customer data transparently and reducing electronic waste. Since we employed a 6-point Likert scale, this results in a theoretical range of the sum from 8 to 48 for each respondent. It should be noted that the minimum (25) and maximum (48) values reported in the table represent the lowest and highest total scores actually observed in the sample.

The data reveal notable patterns in managers' evaluations and implementation of CDR initiatives. Comparing the two evaluative constructs, judgment scores ($M = 39.75$, $SD = 4.92$) are significantly higher than attitude scores ($M = 37.03$, $SD = 5.62$), as confirmed by a paired t -test ($t = 7.36$, $p < .001$). This indicates that managers' ethical evaluations of CDR initiatives exceed their assessments of economic relevance.

A similar pattern emerges when examining implementation variables. Managers report higher intentions to implement CDR initiatives ($M = 26.91$, $SD = 5.72$) compared to their actual (past) implementation ($M = 21.78$, $SD = 5.77$). This intention-action gap is statistically significant as well ($t = 16.02$, $p < .001$).

Subjective norm shows a mean of zero because its constituent variables were standardized, leading to correspondingly moderate variability ($SD = 1.57$). Perceived behavioral control demonstrates relatively high mean scores ($M = 17.99$, $SD = 3.28$), indicating that managers generally perceive themselves as capable of implementing CDR initiatives.

Correlation analysis reveals strong associations between judgment and attitude ($r = 0.512$, $p < .001$). Perceived behavioral control correlates positively with both intention ($r = 0.213$, $p < .01$) and action ($r = 0.274$, $p < .001$). The correlation between intention and action is particularly strong ($r = 0.738$, $p < .001$), providing initial support for H₅.

Table D-2: Descriptive Statistics (Pooled Data)

	<i>N</i>	Mean	SD	Min.	Max.
Judgment	187	39.75	4.92	25	48
Attitude	180	37.03	5.62	18	47
Subjective Norm	187	0.00	1.57	-4.01	3.54
Perceived Behavioral Control	179	17.99	3.28	9	24
Intention	158	26.91	5.72	6	36
Action	156	21.78	5.77	6	33

Min.: minimum, Max.: maximum, SD: standard deviation. Subjective norm is centered, since the construct's variables have been standardized due to different scales.

5.2 Hypothesis Testing

Table D-3 presents the results of OLS regression analyses examining the predictors of intention and the relationship between intention and action. All models use standardized coefficients, and given our directional hypotheses, one-tailed significance tests were employed.

Models 1 and 2 examine the antecedents of intention to implement CDR initiatives. In Model 1, which includes only the theoretical predictors, perceived behavioral control emerges as the sole significant factor ($\beta = 0.20, p < .05$). Neither judgment ($\beta = -0.02, p > .10$) nor attitude ($\beta = 0.12, p > .10$) shows significant effects. Subjective norm also does not reach statistical significance ($\beta = 0.09, p > .10$). The model explains 7.9% of the variance in intention.

Model 2 incorporates control variables, resulting in a modest increase in the explained variance ($R^2 = 0.137$). The pattern of results remains largely consistent with those in Model 1. Perceived behavioral control maintains significance slightly above the 5% threshold ($\beta = 0.16, p = .05$) providing support for H₄. Attitude reaches marginal significance ($\beta = 0.14, p = .09$), offering weak support for H₂. Judgment and subjective norm remain non-significant ($\beta = -0.08, p > .10$; $\beta = 0.10, p > .10$), providing no support for H₁ and H₃.

Models 3 and 4 test the relationship between intention and action. Both models reveal a strong and highly significant effect of intention on action ($\beta = 0.74, p < .001$), providing

robust support for H5. Model 3, containing only the intention-action relationship, explains 54.4% of the variance in action. Model 4, which includes control variables, shows a slight increase in explained variance ($R^2 = 0.575$).

Table D-3: OLS Regression Results (Pooled Data)

	Intention		Action	
	Model 1	Model 2	Model 3	Model 4
Judgment	-0.02	-0.08	-	-
Attitude	0.12	0.14.	-	-
Subjective Norm	0.09	0.10	-	-
Perceived Behavioral Control	0.20*	0.16.	-	-
Intention	-	-	0.74***	0.74***
<i>Position of Participant</i> (Reference: Managing Director and Senior Management Level)				
Division Manager	-	0.03	-	-0.08.
Department Manager	-	-0.05	-	0.07
Team Leader	-	0.07	-	0.02
<i>Employees in Company</i>	-	-0.00	-	0.04
<i>Technology Acceptance</i>	-	0.05	-	0.11*
<i>Social Desirability</i>	-	-0.04	-	-0.00
<i>Industry Controls</i>	No	Yes	No	Yes
<i>N</i>	147	144	156	152
<i>R²</i>	0.079	0.137	0.544	0.575

Table D-3 shows the results obtained by OLS regression with intention (Models 1 and 2) and action (Models 3 and 4) as dependent variables. Models 1 and 3 exclude control variables while Models 2 and 4 include them. The entries represent the standardized coefficients (β), and the respective statistical significance (one-tailed) is indicated by . for $p < .10$, * for $p < .05$, ** for $p < .01$ and *** for $p < .001$. In supplementary analyses, we also tested the direct effect of perceived behavioral control on action, as suggested by the theory of planned behavior. While it showed a significant positive effect ($\beta = 0.11$, $p < .05$), including it did not substantially change our results, and intention remained the dominant predictor.

6 Exploratory Supplemental Analysis: The Dual Nature of CDR

While our main analysis treated CDR as a unified construct, the unique characteristics of digital technologies suggest a more nuanced understanding is needed. Digital technologies present a fundamental duality in their relationship to corporate responsibility: they simultaneously constitute sources of societal challenges and provide means for addressing them (Cardinali and De Giovanni, 2022; Mihale-Wilson *et al.*, 2022). This dual nature manifests in two distinct approaches to CDR that merit separate empirical investigation.

6.1 Conceptualizing Opportunity-Based and Risk-Based CDR

The duality of digital technologies in CDR contexts can be understood through two complementary perspectives. First, technology as problem necessitates what we term “risk-based CDR” – initiatives addressing negative externalities (“footprints”) created by digital technologies. Organizations implementing risk-based CDR recognize potential harms from their digital technology use, including privacy violations, algorithmic bias, and electronic waste, and develop initiatives to mitigate these risks. This approach represents a defensive orientation, responding to identified or anticipated problems.

Second, technology as solution drives what we term “opportunity-based CDR” – initiatives leveraging digital capabilities to create positive societal value. Organizations pursuing opportunity-based CDR view digital technologies as enablers for addressing broader societal challenges, proactively using them to promote, e.g., inclusion, sustainability, or transparency (Cardinali and De Giovanni, 2022). This approach represents a proactive orientation, seeking to maximize positive impacts or “handprints”.

6.2 Theoretical Foundations for Differential Approaches

The distinction between risk-based and opportunity-based CDR aligns with March’s (1991) framework of exploitation versus exploration in organizational learning. Risk-based CDR exemplifies exploitation, focusing on “refinement, choice, production, efficiency, selection, implementation, execution” (March, 1991, p. 71) within established parameters. These initiatives operate within defined regulatory frameworks where success is measured by compliance achievement and risk mitigation. Returns are proximate and predictable, as organizations can assess whether they meet regulatory requirements.

Conversely, opportunity-based CDR represents exploration, involving “search, variation, risk taking, experimentation, play, flexibility, discovery, innovation”

(March, 1991, p. 71). Organizations venture into new territory, experimenting with novel applications of digital technologies. Outcomes are inherently uncertain and distant, as societal impacts may only emerge over time.

This distinction implies different decision-making dynamics. Exploitation-oriented contexts enable convergence on best practices and standardized solutions, with straightforward economic calculations weighing costs against quantifiable risks. Exploration-oriented contexts demand navigation of ambiguity without established templates, requiring experiential learning and stakeholder engagement to legitimize experimental initiatives. These theoretical differences suggest our model components may operate differently across CDR types. In exploitation-oriented risk mitigation, economic evaluations may dominate given predictable outcomes and clear standards. In exploration-oriented opportunity seizing, the absence of benchmarks may shift reliance towards stakeholder support and organizational capabilities. This framework provides the foundation for examining whether our integrated model operates differently across opportunity-based and risk-based CDR contexts.

6.3 Methodological Approach to the Exploratory Analysis

In our survey design, we deliberately captured both types of CDR initiatives. For judgment, attitude, intention, and action, we developed separate items and vignettes capturing opportunity-based initiatives (e.g., using digital technologies to reduce environmental impacts, promote inclusion) and risk-based initiatives (e.g., preventing data misuse, reducing electronic waste). However, we maintained unified measures for subjective norm and perceived behavioral control. For subjective norm, this decision reflects that stakeholders likely focus on CDR outcomes rather than the specific technological mechanisms involved. For perceived behavioral control, we measured participants' general implementation capability, which depends primarily on organizational authority and resources rather than initiative type.

Given these theoretical considerations and our data structure, we conducted an exploratory analysis examining whether our integrated model operates differently across these two CDR types, estimating separate models using the corresponding CDR-type-specific variables (e.g., opportunity-based judgment for opportunity-based models). We emphasize the exploratory nature of this analysis – while theoretical distinctions suggest

potential differences, the specific patterns in CDR decision-making remain an empirical question requiring investigation.

6.4 Descriptive Analysis by CDR Type

The descriptive statistics for the main constructs are presented in Table D-4. As detailed in the descriptive analysis of the pooled data (see Section 5.1), all mean (M) scores are the average of the individual summed scores derived from the respective multi-item scales.

Table D-4: Descriptive Statistics by CDR Type

		<i>N</i>	Mean	SD	Min.	Max.
Judgment	OB	187	19.78	3.00	10	24
	RB	187	19.97	2.64	11	24
Attitude	OB	186	18.20	3.30	7	24
	RB	181	18.81	3.05	10	24
Intention	OB	160	13.05	3.22	3	18
	RB	183	13.96	3.62	3	18
Action	OB	158	10.16	3.42	3	18
	RB	181	11.73	3.86	3	18

Min.: minimum, Max.: maximum, SD: standard deviation. OB: Opportunity-Based, RB: Risk-Based.

Examining the descriptive statistics by CDR type reveals distinct patterns. Within opportunity-based CDR, ethical evaluation (judgment: $M = 19.78$, $SD = 3.00$) is significantly higher than economic evaluation (attitude: $M = 18.20$, $SD = 3.30$; $t = 6.92$, $p < .001$). Similarly, within risk-based CDR, judgment ($M = 19.97$, $SD = 2.64$) exceeds attitude ($M = 18.81$, $SD = 3.05$; $t = 5.36$, $p < .001$). This indicates that managers consistently rate CDR initiatives as more ethically appropriate than economically relevant, regardless of CDR type. Within opportunity-based CDR, intention ($M = 13.05$, $SD = 3.22$) significantly exceeds action ($M = 10.16$, $SD = 3.42$; $t = 13.69$, $p < .001$). The same intention-action gap appears within risk-based CDR, where intention ($M = 13.96$, $SD = 3.62$) exceeds action ($M = 11.73$, $SD = 3.86$; $t = 10.85$, $p < .001$). This consistent gap between intended and actual implementation appears in both CDR contexts.

As different items and vignettes were used for opportunity-based versus risk-based initiatives, comparisons across CDR types are not meaningful. The values provide context for understanding the distinct decision-making patterns revealed in the regression analyses.

6.5 Regression Analysis by CDR Type

The regression results differentiated by CDR type uncover distinct decision-making mechanisms for opportunity-based versus risk-based initiatives, as shown in Table D-5.

Table D-5: OLS Regression Results for Intention by CDR Type

	Opportunity-Based		Risk-Based	
	Model 1	Model 2	Model 3	Model 4
Judgment	-0.03	-0.05	0.05	0.02
Attitude	0.04	0.00	0.16*	0.23**
Subjective Norm	0.10.	0.11.	0.03	0.04
Perceived Behavioral Control	0.38***	0.36***	-0.03	-0.08
<i>Position of Participant</i> (Reference: Managing Director and Senior Management Level)				
Division Manager	-	0.05	-	0.01
Department Manager	-	-0.07	-	0.01
Team Leader	-	0.12.	-	0.00
<i>Employees in Company</i>	-	0.06	-	-0.04
<i>Technology Acceptance</i>	-	0.04	-	0.07
<i>Social Desirability</i>	-	0.03	-	-0.11.
Industry Controls	No	Yes	No	Yes
<i>N</i>	155	151	171	167
<i>R</i>²	0.171	0.240	0.037	0.113

Table D-5 shows the results obtained by OLS regression with opportunity-based intention (Models 1 and 2) and risk-based intention (Model 3 and 4) as dependent variables. Models 1 and 3 exclude control variables while Models 2 and 4 include them. The entries represent the standardized coefficients (β), and the respective statistical significance (one-tailed) is indicated by . for $p < .10$, * for $p < .05$, ** for $p < .01$ and *** for $p < .001$. For opportunity-based models, opportunity-based measures of judgment, attitude and intention were used. For risk-based models, risk-based measures were used. Subjective norm and perceived behavioral control were measured uniformly across CDR types.

For opportunity-based CDR, perceived behavioral control emerges as the dominant predictor of intention ($\beta = 0.36, p < .001$). Judgment and attitude show no significant effects ($\beta = -0.05, p > .10$; $\beta = 0.00, p > .10$). Subjective norm shows a marginally significant but robust effect ($\beta = 0.11, p = .098$). The models explain 17.1% and 24.0% of variance in intention. The intention-action relationship remains strong ($\beta = 0.67, p < .001$), with models explaining 44.3% to 51.9% of variance in action (not shown).

For risk-based CDR, attitude is the primary predictor of intention ($\beta = 0.16, p < .05$; $\beta = 0.23, p < .01$). Judgment, subjective norm, and perceived behavioral control show no significant effects ($\beta = 0.02, p > .10$; $\beta = 0.04, p > .10$; $\beta = -0.08, p > .10$). The models explain only 3.7% and 11.3% of variance. Again, intention exhibits a strong and significant effect on action ($\beta = 0.75, p < .001$), with models explaining 54.7% to 58.3% of variance in action (not shown).

The variance inflation factors for all independent variables across all models do not exceed 1.57, indicating no evidence of multicollinearity.

7 Discussion

7.1 Discussion of Main Findings

The findings of our study reveal nuanced patterns in managerial decision-making regarding CDR initiatives, with notable differences emerging between opportunity-based and risk-based approaches. Our integrated theoretical framework, combining Rest's (1986) four-component model with Ajzen's (1991) theory of planned behavior, provides valuable insights into these decision-making processes.

In our main analysis using pooled data, the limited explanatory power of ethical judgment on intention to implement CDR initiatives (H_1 not supported) reflects a fundamental tension in corporate decision-making. This finding aligns with the ongoing debate between shareholder primacy (Friedman, 1970) and stakeholder theory (Freeman, 1984), suggesting that economic imperatives continue to dominate managerial decision-making even in contexts with clear ethical dimensions (Carroll, 1991; Porter and Kramer, 2006). The weak support for the attitude-intention relationship ($H_2, \beta = 0.14, p = .09$) indicates that while economic considerations matter, they alone do not strongly drive CDR implementation decisions when examining CDR as a unified construct.

The non-significant effect of subjective norm on intention (H_3 not supported) in the pooled analysis is particularly intriguing given the stakeholder-centric nature of CDR. This finding suggests that when CDR is treated undifferentiated, the diverse and sometimes contradictory stakeholder expectations (Carl *et al.*, 2024; Mueller, 2022) may cancel each other out, resulting in no clear normative influence on managerial intentions.

Perceived behavioral control emerged as the most consistent predictor of intention in the pooled analysis (H_4 supported), highlighting the importance of organizational capabilities and resources in CDR implementation (Elliott and Copilah-Ali, 2024). This finding underscores that managers' confidence in their ability to implement CDR initiatives is crucial, suggesting that capability-building should be a priority for organizations seeking to enhance their digital responsibility. The significance of perceived behavioral control aligns with the work by Cheng *et al.* (2024) on the importance of operational resilience in digital implementation.

The strong intention-action relationship (H_5 supported, $\beta = 0.74$, $p < .001$) confirms the robust predictive power of behavioral intentions, consistent with the theory of planned behavior (Ajzen, 1991) and ethical decision-making literature (Craft, 2013; Lehnert *et al.*, 2015; O'Fallon and Butterfield, 2005). This finding validates the importance of understanding intention formation in CDR contexts, as intentions serve as a strong driver of actual implementation.

7.2 The Necessity of Differentiated Analysis: Uncovering Hidden Effects

A critical insight from our study emerges from comparing the pooled analysis with the supplemental analysis differentiating between opportunity-based and risk-based CDR. The supplemental analysis reveals that treating CDR as a unified construct masks important relationships and suppresses significant effects. When we separate CDR types, previously non-significant or weakly significant relationships become stronger and more clearly defined, while entirely new patterns emerge that were hidden in the aggregated data.

For instance, attitude's effect on intention, which showed only marginal significance in the pooled analysis ($\beta = 0.14$, $p = .09$), becomes significant for risk-based CDR ($\beta = 0.23$, $p < .01$) while disappearing entirely for opportunity-based CDR. Similarly, the role of perceived behavioral control, which appeared as a general predictor in the pooled analysis, reveals itself as specifically relevant only for opportunity-based CDR ($\beta = 0.36$,

$p < .001$), with no significant effect on risk-based initiatives. This pattern of effects splitting and intensifying demonstrates that aggregating different types of CDR initiatives obscures the distinct decision-making mechanisms at play.

Moreover, the supplemental analysis uncovers previously hidden effects. The marginal influence of subjective norm on opportunity-based CDR ($\beta = 0.11$, $p = .098$) only becomes visible when examining CDR types separately, suggesting that stakeholder expectations operate selectively rather than uniformly across all digital responsibility initiatives. These findings strongly support the theoretical necessity of caution against treating digital responsibility as a homogeneous construct.

7.3 The Dual Nature of CDR: Insights from the Exploratory Analysis

Our exploratory analysis reveals that treating CDR as a unified construct obscures important differences in decision-making mechanisms. The distinction between opportunity-based and risk-based CDR, grounded in March's (1991) exploration-exploitation framework, uncovers fundamentally different patterns of managerial decision-making.

The Dominance of Economic Considerations in Risk-Based CDR

The emergence of attitude as the sole significant predictor for risk-based CDR initiatives reflects a fundamentally compliance-oriented decision-making process. This finding is strongly consistent with prospect theory (Kahneman and Tversky, 1979), which posits that decision-makers are loss-averse, weighing potential losses more heavily than equivalent gains. In risk-based contexts, the decision is thus framed as one of loss avoidance. Managers appear to evaluate CDR initiatives primarily through an economic lens, driven by the costs of non-implementation, such as regulatory penalties or reputational damage (Hartley *et al.*, 2024; Wirtz *et al.*, 2023). These initiatives are perceived as means to mitigate tangible financial losses, making their economic value (attitude) the key driver of implementation intention. This logic also aligns with our framing of risk-based CDR as a form of March's (1991) exploitation, where organizations focus on "refinement, choice, production, efficiency, selection, implementation, execution" (p. 71) – activities that manage known parameters and reduce risk, rather than exploring uncertain, novel opportunities.

The absence of significant effects for judgment in risk-based CDR decision-making further indicates that risk-based CDR operates within a framework of "non-negotiable"

compliance requirements, where individual ethical evaluations become secondary to financial imperatives the decision process. The finding resonates with critiques of CSR that highlight the tension between ethical aspirations and economic realities (Friedman, 1970; Porter and Kramer, 2006). As Porter and Kramer (2006) argue, “the prevailing approaches to CSR are so disconnected from business as to obscure many of the greatest opportunities for companies to benefit society” (p. 78), suggesting that when CSR is framed primarily in compliance terms, it loses its strategic potential.

Similarly, subjective norm shows no significant effect for risk-based CDR. As Schrödter and Weißenberger (2024) demonstrate, stakeholder pressure does not significantly influence the implementation of digital compliance initiatives, likely because they are presumed as a “must-be” and thus not actively demanded and influenced by stakeholders (Matzler *et al.*, 1996). This suggests that companies adopt risk-based CDR based on internal policies, regulatory guidance, or risk management considerations, rather than direct stakeholder expectations (Hartley *et al.*, 2024). Unlike opportunity-based initiatives, risk-based CDR frequently takes a reactive stance, focusing on adhering to established rules and minimizing potential liabilities. While stakeholder expectations are likely still relevant, they might remain implicit without actively shaping managerial decisions to the same degree.

Due to often being mandated by internal policies and regulatory guidelines, individual managers are left with limited managerial discretion, which is further underscored by the non-significance of perceived behavioral control in risk-based contexts. Supporting this point, analyzing the most limiting factors selected by managers in our survey, we found that only when managers perceive a lack of support from top management or shareholders is their motivation to implement risk-based initiatives significantly lower compared to opportunity-based initiatives, at the same level of perceived behavioral control ($p < .05$). Interesting to note, other potential barriers (i.e., technological know-how, personnel capacity, IT infrastructure, and financial resources) do not exhibit significant differences in their moderating effects on perceived behavioral control-intention relationships between opportunity-based and risk-based contexts, suggesting that these factors are equally influential across both types of CDR initiatives.

The Role of Agency and Stakeholder Influence in Opportunity-Based CDR

In stark contrast, opportunity-based CDR demonstrates a decision-making pattern more aligned with traditional models of (non)volitional behavior. The strong significance of perceived behavioral control underscores the importance of managerial agency in pursuing innovative digital initiatives for societal benefit. Opportunity-based CDR initiatives require creativity, flexibility, and strategic adaptation to leverage digital technologies for positive societal impacts. Managers must perceive sufficient organizational support and control over internal resources and their capabilities to pursue these innovative initiatives (Cheng *et al.*, 2024).

The marginal significance of subjective norm for opportunity-based CDR reveals another dimension obscured in the pooled analysis. Unlike risk-based initiatives, which appear insulated from direct stakeholder influence, opportunity-based initiatives seem more responsive to external expectations. Managers are likely more receptive to stakeholder expectations, as these initiatives require active engagement and external validation to gain support. Opportunity-based CDR is typically viewed as optional, becoming relevant primarily when external stakeholders exert pressure to adopt such initiatives.

The non-significance of judgment for opportunity-based CDR mirrors the pattern observed in risk-based contexts, reinforcing the limited role of ethical evaluations in CDR decision-making across both types. In contrast to risk-based CDR, attitude shows no significant effect as well. This might be due to the benefits of opportunity-based CDR, such as enhanced brand image or customer satisfaction, often being more uncertain and long-term (Lobschat *et al.*, 2021; March, 1991), which may weaken the connection between economic evaluation and implementation intention.

7.4 Implications and Limitations

Theoretical Implications

Our research makes three distinct theoretical contributions to diverse literature streams. First, we contribute to the ethical decision-making literature (Craft, 2013; Lehnert *et al.*, 2015; O'Fallon and Butterfield, 2005) by demonstrating the necessity of integrating Rest's (1986) four-component model with Ajzen's (1991) theory of planned behavior for contexts where ethical imperatives intersect with economic constraints and resource dependencies. Second, we advance CDR research (Lobschat *et al.*, 2021; Hartley *et al.*,

2024; *Carl et al.*, 2024) by providing the first systematic empirical investigation of micro-level managerial decision-making in CDR contexts. While existing CDR literature has focused on institutional drivers (e.g., Trittin-Ulbrich and Böckel, 2022; Vo Thai *et al.*, 2024) and outcome metrics (e.g., Oduro *et al.*, 2024), our study reveals that the opportunity-based versus risk-based distinction is a critical determinant of internal implementation decisions. Third, this study contributes to organizational learning theory by grounding the risk-based versus opportunity-based CDR distinction in March's (1991) exploration-exploitation framework. This reveals fundamentally different decision-making logics: exploitation dynamics (efficiency, compliance, economic calculation) for risk-based CDR and exploration dynamics (uncertainty, experimentation, capability reliance) for opportunity-based CDR.

A particularly noteworthy finding is the persistent non-significance of judgment across all analyses, which challenges fundamental assumptions about the role of moral reasoning in organizational contexts (Craft, 2013; Lehnert *et al.*, 2015). This suggests that future research should carefully consider whether purely moral-cognitive frameworks adequately capture corporate decision-making dynamics or require integration with economic and resource-based perspectives. Our findings underscore that a unified approach to CDR yields inconsistent results, necessitating separate theoretical and empirical treatment of risk-based and opportunity-based initiatives.

Practical Implications

From a practical standpoint, our findings provide concrete insights for the design of targeted management control systems that account for the distinct decision-making logics underlying risk-based and opportunity-based CDR.

For risk-based CDR, where economic evaluation (attitude) drives implementation intentions, control systems should emphasize financial performance metrics and compliance tracking. Specifically, this can include developing cost-benefit analyses highlighting economic consequences of non-implementation (e.g., regulatory penalties, reputational damage; Hartley *et al.*, 2024; Wirtz *et al.*, 2023) and aligning incentive systems with tangible, short-term economic outcomes of risk mitigation.

For opportunity-based CDR, where organizational capabilities (perceived behavioral control) and stakeholder expectations (subjective norm) are decisive, control systems should adopt a capability-development and stakeholder-engagement orientation. This can

involve establishing capability-building metrics tracking skill development, cross-functional collaboration, and resource availability (Cheng *et al.*, 2024), implementing stakeholder feedback mechanisms that systematically capture external expectations, as well as designing long-term performance indicators reflecting exploration dynamics rather than immediate financial returns (March, 1991; Lobschat *et al.*, 2021).

Differentiating between the motivations and processes driving opportunity-based versus risk-based CDR is essential for aligning corporate strategies with societal expectations and business objectives.

Limitations

Despite its contributions, this study has several limitations. First, its focus on German companies may limit the generalizability due to national and cultural influences on ethical decision-making (Craft, 2013; Lehnert *et al.*, 2015; O’Fallon and Butterfield, 2005). Additionally, the sample mainly comprises small and medium-sized enterprises, possibly further limiting generalizability due to specifics such as resource availability or exposure (Lobschat *et al.*, 2021). Second, while integrating Rest’s (1986) four-component model and Ajzen’s (1991) theory of planned behavior offers a comprehensive framework, factors like moral intensity and specific organizational influences were not included, despite their possible impact (Jones, 1991; Treviño *et al.*, 2006). Also, the exclusion of the awareness component from Rest’s model may limit the comprehensive understanding of the ethical decision-making process. Third, self-reported survey data may introduce social desirability and common-method bias (Podsakoff *et al.*, 2003). Even though social desirability was controlled for in the analysis, it remains a potential limitation affecting the validity of responses. Forth, the study does not establish a temporal sequence between intention and action, requiring cautious causal inferences. Experimental designs or longitudinal studies could address both aforementioned limitations and provide more robust insights. Future research should address these issues to refine ethical decision-making frameworks in CDR.

Finally, a limitation concerns the differential applicability of certain CDR initiatives across business models. While we controlled for industry and company size and framed vignettes to assess intentions toward “similar” initiatives rather than identical implementations, some scenarios (e.g., supply chain transparency using blockchain) may have

varying relevance depending on operational complexity. Future research could develop typologies of initiatives that correspond specifically to organizational archetypes.

8 Conclusion

This study reveals that managerial decision-making in CDR follows fundamentally different patterns for opportunity-based versus risk-based CDR initiatives. By integrating Rest's (1986) four-component model with Ajzen's (1991) theory of planned behavior, we demonstrate that treating CDR as a unified construct masks critical differences in how managers approach digital responsibility initiatives.

Our key finding is that risk-based CDR decisions are driven primarily by economic considerations (attitude), while opportunity-based CDR depends on organizational capabilities (perceived behavioral control) and, to a lesser extent, stakeholder expectations (subjective norm). The non-significance of ethical judgment across both types challenges assumptions about the role of moral reasoning in corporate decision-making contexts.

Our study contributes to CDR research by applying behavioral models to digital responsibility and highlighting the distinct motivational structures behind risk- and opportunity-based CDR decisions. Practically, the findings suggest that managers should align their CDR strategies accordingly – emphasizing economic value for risk-based initiatives while building capabilities and stakeholder engagement for opportunity-based initiatives. The strong and robust intention-action relationship across all models confirms that forming implementation intentions is a critical intervention point.

Future research should employ longitudinal designs to better capture the temporal dynamics of CDR decision-making and explore additional contextual factors.

As digital transformation accelerates, understanding the distinct logics governing different types of CDR becomes essential to supporting responsible innovation that balances business objectives with societal well-being. Our findings underscore that effective CDR requires not a one-size-fits-all approach but rather sophisticated strategies tailored to the specific nature of digital responsibility challenges and opportunities.

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Appendices

Appendix D-I: Questionnaire Items for the Judgment Constructs

Variable	Items
Judgment OB^a	To what extent do you personally consider the following initiatives to be ethically correct?
	- Promotion of digital participation and competence development among employees and customers (e.g., for people with limited access to digital technologies)
	- Free provision of socially relevant data and digital knowledge (e.g., for health or development)
	- Use of digital technologies to reduce negative environmental impacts (e.g., by closing material cycles)
Judgment RB^a	- Use of digital technologies for more transparent supply chains and fairness along the value chain
	To what extent do you personally consider the following initiatives to be ethically correct?
	- Striving for accessibility of digital services and tools (e.g., for people with physical or mental disabilities)
	- Sparing and transparent handling of data from customers and employees
Judgment RB^a	- Reduction of negative environmental impacts caused by digital technologies (e.g., electronic waste, high energy consumption)
	- Consciously limiting the use of artificial intelligence for data analysis (e.g., to protect personal rights and prevent discrimination)

^a Six-point Likert scale “Not ethical at all.” to “Completely ethical.”.

Appendix D-II: Questionnaire Items for the Attitude Constructs

Variable	Items
Attitude OB^a	How important do you personally consider the following initiatives for the sustainable continuance of companies?
	- Promoting digital participation and competence development among employees and customers with limited access to digital technologies, even if this causes additional costs.
	- Providing data and digital knowledge relevant to society (e.g., for health or development) as open source, even if this reduces potential financial outcomes.
	- Using digital technologies specifically to reduce negative environmental impacts (e.g., by closing material cycles), even if this involves higher costs.
Attitude RB^a	- Creating transparent supply chains and fairness along the value chain with the help of digital technologies, even if this causes costs.
	How important do you personally consider the following initiatives for the sustainable continuance of companies?
	- Striving for accessibility of digital services and tools to ensure no groups are disadvantaged, even if this is associated with costs.
	- Handling customer and employee data transparently and sparingly, even if this limits the scope for evaluation and use.
	- Reducing negative environmental impacts that arise within the company due to digitalization (e.g., electronic waste and high energy consumption), even if this entails additional costs.
	- Consciously limiting the use of artificial intelligence for data analysis to protect personal rights and prevent discrimination, even if this reduces the potential for use.

^a Six-point Likert scale “Not important at all.” to “Extremely important.”.

Appendix D-III: Questionnaire Items for the Subjective Norm Construct

Variable	Items
Subjective Norm_1^a	Which of the groups mentioned do you think expect your company to act responsibly and sustainably in the use of digital technologies and data? - Employees - Local government - Federal government - Environmental organizations - Owners/Shareholders - Management - Customers - Non-profit/social institutions - Society - Suppliers - Competitors - Other (please specify):
Subjective Norm_2^b	My company is under high pressure from various stakeholders who expect responsible and sustainable action from me regarding digitalization.

^a Multiple choice.^b Six-point Likert scale “Strongly disagree.” to “Strongly agree.”.

Appendix D-IV: Questionnaire Items for the Perceived Behavioral Control Construct and Implementation Constrains

Variable	Items
Perceived Behavioral Control^a	How do you assess the following statements?
	- I can implement initiatives to promote digital participation and accessibility in my company.
	- I can implement initiatives for responsible handling of customer and employee data in my company.
	- I can implement initiatives in my company to reduce environmental impacts using digital technologies or to reduce environmental impacts caused by digital technologies.
Implementation Constrains^b	- I can implement initiatives to increase the transparency of the supply chain using digital technologies in my company.
	The implementation of these initiatives is primarily constrained by:
	- Technological know-how.
	- Personnel capacity.
	- IT infrastructure.
	- Financial resources.
	- Support from the executive management or shareholders.
	- None of the above.

^a Six-point Likert scale “Strongly disagree.” to “Strongly agree.”.

^b Single choice.

Appendix D-V: Questionnaire Items and Vignettes for the Dependent Variables

Variable	Items
Intention^a	I would implement similar initiatives in my company.
Action^a	I have already implemented similar initiatives in my company.
Focus	Vignettes
OB	- In production, digital technologies are used to support employees in their work, significantly reducing their workload. The necessary hardware and software incurred substantial costs. - An internal project is initiated, in which digital technologies are used to analyze and reduce emissions and waste in production. In the first few years, the implementation costs exceed the cost savings. - Blockchain technology is used to create greater transparency along the value chain to exclude unfair conditions in the supply chain. Due to the complexity of the technology, this involves considerable effort.
RB	- A new working time concept is introduced, whereby, among other things, emails and phone calls are not delivered to employees between 8:00 p.m. and 6:00 a.m. to prevent stress and overload from constant availability during remote work. This is accompanied by a reduction in productivity. - Digital technologies with significant energy consumption are used. Therefore, the company switches to electricity from renewable sources, resulting in noticeably higher electricity costs. - Customer profiles are not sold to other companies for advertising purposes, which means forgoing a noticeable profit.

^a Six-point Likert scale “Strongly disagree.” to “Strongly agree.”.

Appendix D-VI: Questionnaire Items for the Control Variables

Variable	Items
Position^a	What is your position in the company? - Managing director and senior management level - Division manager - Department manager - Team leader - Employee without a managerial position
Technology Acceptance^b	How do you personally rate the following statements? - With the help of digital technologies, I can make decisions or complete tasks faster. - It usually does not take me long to acquire skills in digital technologies. - I enjoy using digital technologies. - I have the necessary knowledge to use digital technologies. - People whose opinions are important to me advise me to use digital technologies. - I intend to use more digital technologies in the future.
Social Desirability^c	How do you personally rate the following statements? - I have received too much change from a salesperson without telling him or her - I am always honest with others. - There have been occasions when I have taken advantage of someone

(continued on next page)

Variable	Items
Industry ^a	What industry does your company operate in?
	- Agriculture and Food Industry
	- Construction
	- Service and Consulting
	- Healthcare
	- Trading
	- Manufacturing
	- Hotel, Gastronomy, and Leisure
	- IT, Telecommunications, and Media
	- Logistics, Transportation
	- Industry
	- Other: (please specify)
Employees in Company	How many employees does your company have?

^a Simple Choice.

^b Six-point Likert scale “Strongly disagree.” to “Strongly agree.”, items based on Venkatesh *et al.* (2012).

^c Six-point Likert scale “Does not apply at all.” to “Applies completely.”, items from Feder and Weißenberger (2019), based on Winkler *et al.* (2006) and Paulhus (1984).

E Substantive vs. Symbolic: Strategic Communication of Corporate Digital Responsibility under Observability

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Substantive vs. Symbolic: Strategic Communication of Corporate Digital Responsibility under Observability

Abstract

This study examines how organizations communicate different types of Corporate Digital Responsibility (CDR) initiatives and how observability influences these communication strategies. Drawing on signaling and legitimacy theories, we distinguish between opportunity-based CDR (leveraging technology for societal value) and risk-based CDR (mitigating digital harms). Using survey data from 187 German managers, we find that these CDR types follow fundamentally different communication logics. Risk-based CDR shows a strong, consistent relationship with communication that remains unaffected by observability, suggesting an institutional imperative for legitimacy maintenance. In contrast, opportunity-based CDR reveals a strategic tension between substantive action and symbolic signaling. Under low observability, organizations follow traditional signaling patterns. However, under high observability, a decoupling effect occurs: organizations with minimal initiatives engage in intensive communication, revealing a pattern of compensatory symbolic management to mask visible underperformance. These findings challenge monolithic approaches to CDR and reveal how observability creates boundary conditions for established theories in digital contexts. The study contributes to understanding strategic communication in digital responsibility by demonstrating that defensive and proactive CDR initiatives require fundamentally different communication approaches, with important implications for how organizations manage their digital responsibility narratives.

Keywords: Corporate Digital Responsibility, CDR Communication, Signaling Theory, Legitimacy Theory, Observability, Strategic Disclosure

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JEL Classification: M14, O3

1 Introduction

Digital transformation has fundamentally altered how organizations create value and impact society. While digital technologies enable unprecedented innovation and efficiency, they simultaneously introduce novel risks, including algorithmic bias, privacy violations, and environmental impacts from energy-intensive computing (Carl *et al.*, 2024). This duality – technologies as both sources of challenges and means for addressing them (Cardinali and De Giovanni, 2022; Mihale-Wilson *et al.*, 2022) – raises critical questions about organizational responsibilities in the digital age.

Corporate Digital Responsibility (CDR) goes beyond traditional Corporate Social Responsibility (CSR) by specifically addressing the ethical implications and societal consequences of digital technology deployment (Lobschat *et al.*, 2021). This specific lens is necessitated by digital technology's inherent characteristics: strong penetration into all areas of life, high malleability, and exponential development (Lobschat *et al.*, 2021). These traits create unprecedented, value-laden opportunities and risks for both people and the environment. This unique focus has granted CDR significant strategic importance (Lobschat *et al.*, 2021; Wirtz *et al.*, 2023). In part, it represents a response to stakeholder expectations, e.g., investors increasingly demanding responsible AI governance, regulators imposing data protection requirements, and employees expecting ethical technology use (Carl *et al.*, 2024). Beyond this, CDR serves as a strategic differentiator, enabling organizations to position themselves in competitive markets through innovative digital solutions that create societal value while enhancing reputation and building trust (Cardinali and De Giovanni, 2022; Oduro *et al.*, 2024; Vo Thai *et al.*, 2024).

This strategic duality reflects two fundamentally different types of CDR. Risk-based CDR focuses on mitigating negative impacts – the “footprints” of digital technologies – through defensive initiatives addressing, e.g., data privacy, algorithmic discrimination, or cybersecurity threats (Carl *et al.*, 2024). Opportunity-based CDR, conversely, leverages digital capabilities to create positive societal value (“handprints”) through proactive initiatives like AI for healthcare accessibility or blockchain for supply chain transparency (Cardinali and De Giovanni, 2022).

However, realizing either defensive legitimacy or strategic differentiation faces a critical challenge: Most CDR initiatives operate invisibly within organizational boundaries. Proprietary algorithms, internal protocols, and backend security systems remain inherently

opaque to external stakeholders (Flyverbom, 2016). Without deliberate disclosure, even the most comprehensive CDR initiatives – whether risk-mitigating or opportunity-seizing – fail to influence stakeholder perceptions (Connelly *et al.*, 2011). This visibility gap makes strategic communication essential (Schnackenberg and Tomlinson, 2016). Organizations must actively communicate their CDR initiatives to inform stakeholders, thereby maintaining legitimacy and materializing competitive advantages.

This strategic choice, however, opens the door for a critical ethical dilemma: the potential for symbolic management (Ashforth and Gibbs, 1990). While substantive action involves material changes in organizational practices, symbolic communication focuses on constructing and altering perceptions to create an image of responsibility decoupled from actual performance (Wickert *et al.*, 2016). CDR is particularly susceptible to such symbolic gestures due to its inherent complexity and the “invisibility” of digital processes like algorithms or data governance (Flyverbom, 2016).

The communication imperatives likely differ between CDR types. Risk-based initiatives, often addressing stakeholder expectations, may require consistent communication to demonstrate compliance and maintain legitimacy (Suchman, 1995). Opportunity-based initiatives, often serving as differentiators, may follow more strategic communication patterns that go beyond mere legitimacy maintenance. Moreover, the observability of different initiatives introduces additional complexity. When actions are already naturally visible to stakeholders, managers possess greater discretion in their communication choices. This discretion could reveal strategic behavior, since organizations might communicate differently about observable versus unobservable initiatives, potentially exposing gaps between actual implementation and communication intensity. Understanding how observability shapes communication strategies for different CDR types becomes crucial for both theoretical understanding and managerial practice.

The emerging CDR disclosure literature provides initial insights while revealing critical gaps in our understanding. Merbecks (2024) analyzed CDR-related reporting in German DAX 30 companies’ non-financial reports, finding that while companies actively disclose CDR initiatives and concepts, they provide no disclosure on CDR-related risks. Bonsón *et al.* (2023) examined automated decision-making disclosures in annual and sustainability reports from Western European companies, discovering that such disclosure remains at an early stage, with only 3.85% of decision-making mentions relating to automation,

predominantly in the financial sector. Meanwhile, Oduro *et al.* (2024) explored the relationship between CDR and financial performance in an emerging market context, demonstrating that CDR communication influences financial outcomes indirectly through firm reputation as a full mediating mechanism.

While these studies provide valuable empirical evidence of CDR disclosure practices and outcomes, they treat CDR as a monolithic construct. None examines how different CDR types – risk-based versus opportunity-based initiatives – shape distinct communication strategies, nor how the observability of these initiatives moderates organizational communication decisions. This gap is particularly problematic given that risk mitigation and opportunity creation likely follow fundamentally different strategic logics, as suggested by March's (1991) exploration-exploitation framework.

This study contributes to addressing these important research gaps by investigating the strategic communication patterns organizations employ when sharing information about their digital responsibility initiatives, while accounting for both the distinct characteristics of different CDR approaches and the moderating influence of perceived observability. Drawing on signaling theory (Spence, 1973) and legitimacy theory (Suchman, 1995), we argue that risk-based CDR communication follows institutional imperatives regardless of observability (DiMaggio and Powell, 1983), while opportunity-based CDR communication reflects strategic discretion moderated by the natural visibility of actions (Connelly *et al.*, 2011).

Using survey data from 187 German managers, we find striking differences: Risk-based CDR shows a strong, consistent relationship with CDR communication that remains unaffected by observability levels. This suggests an institutional imperative – organizations communicate defensive initiatives to maintain legitimacy regardless of observability. In contrast, opportunity-based CDR reveals a complex interaction with observability. Under low observability, organizations with higher opportunity-based actions communicate more – which is expected signaling behavior. However, under high observability, this pattern shifts unexpectedly: Organizations with minimal opportunity-based initiatives engage in intensive communication, suggesting compensatory symbolic management (Ashforth and Gibbs, 1990) when underperformance is visible to stakeholders.

We make three key contributions. First, we empirically demonstrate that risk-based and opportunity-based CDR are not merely different conceptual perspectives but distinct

phenomena with fundamentally different communication dynamics – one driven by legitimacy maintenance, the other by strategic signaling moderated by observability. Second, we show how established theories operate differently in digital contexts: legitimacy theory governs risk-based CDR communication as an institutional necessity, while signaling theory explains opportunity-based CDR communication but with boundary conditions. Third, we reveal that observability does not simply reduce communication needs but fundamentally alters the action-communication relationship, particularly exposing how organizations manage visible underperformance through symbolic communication. These insights challenge both monolithic approaches to CDR and simplistic applications of signaling theory in digital contexts.

The paper proceeds as follows: Section 2 establishes our theoretical framework, Section 3 outlines our hypotheses, Section 4 describes the methodology, Section 5 presents our results, Section 6 discusses the findings and draws implications and limitations, and Section 7 concludes the paper.

2 Theoretical Framework

This paper builds on a multi-theoretical framework to explain why and how organizations communicate their CDR initiatives. We argue that treating CDR as a monolithic concept obscures different, and at times opposing, underlying motivations. To investigate this, we first conceptualize CDR as a dual construct. We then integrate two core theoretical lenses – signaling theory and legitimacy theory – to explain the distinct communication logics that follow from this duality. Finally, we introduce observability as the critical contextual factor that determines when and why these logics apply, creating a nuanced model for predicting organizational communication strategies.

2.1 Conceptualizing CDR: A Duality of Opportunity and Risk

While CSR has long guided firms in managing their social impacts, CDR addresses the unique challenges of digitalization (Lobschat *et al.*, 2021). We suggest that these challenges are best understood through a dual lens that distinguishes between proactive, value-creating initiatives and defensive, harm-mitigating ones. This duality can be framed as creating positive “handprints” versus minimizing negative “footprints” of digital

technologies. This conceptual distinction is theoretically grounded in March's (1991) seminal work on exploration and exploitation in organizational learning.

Opportunity-based CDR as Exploration

We define opportunity-based CDR as proactive initiatives that leverage digital technologies to create positive societal value, often beyond baseline expectations. These actions are analogous to organizational exploration, which is characterized by “search, variation, risk taking, experimentation, play, flexibility, discovery, innovation” (March, 1991, p. 71). Their goal is to discover new possibilities, such as using AI to reduce emissions or developing digital tools for social inclusion. The returns on such initiatives are often uncertain and long-term, and their value is not immediately apparent (March, 1991).

Risk-based CDR as Exploitation

In contrast, we define risk-based CDR as defensive initiatives focused on mitigating the potential negative impacts and inherent risks of digital technologies. These actions are analogous to organizational exploitation, which emphasizes “refinement, choice, production, efficiency, selection, implementation, execution” (March, 1991, p. 71). This involves adhering to established best practices and norms to prevent harms like data privacy violations or algorithmic bias. The goal is to achieve compliance and align with societal and legal expectations, resulting in more predictable returns (March, 1991), often framed as the avoidance of costs such as fines or reputational damage.

This fundamental distinction in the nature of CDR initiatives implies that they are driven by different strategic logics and, consequently, require different communication approaches.

2.2 Core Theoretical Lenses for CDR Communication

Signaling Theory

Originally developed by Spence (1973) in the context of labor markets, signaling theory addresses how information asymmetries between two parties can be reduced by employing costly signals that indicate latent qualities and intents (Connelly *et al.*, 2011; Spence, 2002; Stiglitz, 2000). The theory has been extended to various organizational contexts and can explain how companies strategically communicate to convey difficult-to-observe attributes to their stakeholders who possess incomplete information. In communication contexts, it can thus illuminate why organizations deliberately disclose or purposefully

withhold certain information (Granados *et al.*, 2010; Schnackenberg and Tomlinson, 2016). Since stakeholders interpret both the presence and absence of signals, organizations must carefully evaluate the strategic implications of their communication choices (Albu and Flyverbom, 2019; Lyon and Montgomery, 2015; Marquis *et al.*, 2016). Ultimately, the effectiveness of these signals depends on characteristics including their costliness and observability to target audiences (Connelly *et al.*, 2011). The theory provides a powerful lens for analyzing why and when firms choose to voluntarily communicate information to influence stakeholder perceptions and gain strategic advantages (Porter and Kramer, 2006).

Legitimacy Theory

Legitimacy theory offers a complementary perspective for understanding how organizations maintain congruence between their actions and socially constructed expectations (Suchman, 1995). Suchman (1995, p. 574) defines organizational legitimacy as “a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions”. This legitimacy serves as a critical foundation that significantly facilitates organizational survival and success through, e.g., access to resources.

The literature delineates three distinct dimensions of legitimacy (Suchman, 1995): pragmatic legitimacy (derived from stakeholders’ self-interest), moral legitimacy (based on normative evaluations of organizational behavior), and cognitive legitimacy (emerging from comprehensibility and taken-for-grantedness). To manage these legitimacy dimensions, organizations employ various strategic approaches, including conforming to external expectations, selecting environments with compatible value systems, and strategically manipulating (i.e., actively shaping) stakeholder perceptions through strategic communication (Scherer *et al.*, 2013; Suchman, 1995).

When facing legitimacy challenges, organizations typically employ a dual response approach (Ashforth and Gibbs, 1990). This involves implementing substantive actions to address underlying material issues while simultaneously utilizing symbolic management techniques that frame these actions in alignment with stakeholder expectations. This legitimization process involves strategic disclosure decisions regarding which organizational activities to communicate and how to contextualize them within broader societal narratives (Deegan, 2002; Fernando and Lawrence, 2014; Higgins and Walker, 2012).

Importantly, legitimacy theory suggests that disclosing information (even beyond regulatory requirements) is more urgent when organizations face significant legitimacy threats (Deegan and Rankin, 1996; Patten, 2002). In these situations, organizations have limited strategic discretion and must focus primarily on repairing their threatened legitimacy through defensive disclosure strategies (Ashforth and Gibbs, 1990; Dowling and Pfeffer, 1975; Suchman, 1995). Conversely, when legitimacy is relatively secure and not under immediate threat, organizations possess greater strategic discretion in their disclosure decisions, allowing them to prioritize competitive considerations, reputation enhancement, or resource allocation efficiency rather than defensive legitimation efforts (Deegan and Gordon, 1996; O'Donovan, 2002). This distinction highlights the differential motivations underlying disclosure patterns across various organizational activities and contexts.

2.3 Observability in Organizational Settings

A critical factor influencing communication strategies is observability, defined as the degree to which stakeholders can perceive organizational actions and their outcomes without deliberate disclosure from the organization (Bernstein, 2012). While the related concept of transparency involves intentional communication of information (e.g., through reports) (Schnackenberg and Tomlinson, 2016), observability captures the inherent visibility baseline that exists prior to any disclosure decisions. Observability varies across organizational contexts due to several factors. For instance, physical distance and time lags between action and impact can obscure activities (Lange and Washburn, 2012), while, as Flyverbom (2016) highlights, digital technologies mediate visibilities by creating new forms of transparency while simultaneously introducing opacity through algorithmic complexity and data volume. As a result, some activities are inherently visible to certain stakeholders through, e.g., direct experience, third-party verification, or public attention, while others remain opaque without deliberate organizational disclosure.

Observability is a key contextual variable because it shapes the level of information asymmetry between the firm and its environment, thereby influencing the conditions under which the logics of signaling and legitimation operate.

3 Hypotheses Development

The Strategic Communication of Opportunity-Based CDR

Opportunity-based CDR initiatives represent strategic organizational choices that extend far beyond compliance requirements. These initiatives focus on the proactive creation of societal value through digital technology, the existence and quality of which tend to be difficult to grasp or manifest only in the long term. From a signaling theory perspective, organizations implementing such initiatives face high information asymmetries with stakeholders who cannot fully observe these proactive efforts (Connelly *et al.*, 2011; Spence, 1973). Since these initiatives are primarily aimed at enhancing competitive positioning, the high information asymmetry creates a strong incentive for deliberate communication to convey the organization's commitment to digital innovation for societal benefit.

The nature of opportunity-based CDR reflects what March (1991) characterizes as organizational exploration – involving experimentation, flexibility, discovery, and innovation. These exploratory initiatives often lack established templates or clear performance metrics, making their value less immediately apparent. In the digital context, where positive impacts may be indirect or long-term, communication becomes essential for making these contributions visible and understandable.

Organizations face strong incentives to internally communicate opportunity-based CDR. Embedding sustainability values within the corporate culture is a key step to support long-term initiatives, which requires deliberate communication of these values (Linnenluecke and Griffiths, 2010). Furthermore, because exploration is inherently risky and resource-intensive (March, 1991), justifying the necessary allocation of resources demands convincing internal communication that articulates the strategic vision and potential long-term benefits (Lobschat *et al.*, 2021). External communication serves to realize the strategic benefits of opportunity-based CDR. Like CSR, when CDR is approached strategically, it can be “a source of opportunity, innovation, and competitive advantage” (Porter and Kramer, 2006, p. 80). Communicating these initiatives can, e.g., enhance corporate reputation, which in turn has a positive, mediating effect on financial performance (Oduro *et al.*, 2024).

Therefore, we hypothesize:

***H₁:** Organizations with higher levels of opportunity-based CDR implementation will exhibit higher levels of CDR communication.*

The Legitimacy-Driven Communication of Risk-Based CDR

Risk-based CDR initiatives address what organizations recognize as their responsibility to prevent digital harms, such as data privacy violations or algorithmic bias. From a legitimacy theory perspective, such initiatives help organizations maintain congruence with societal expectations regarding responsible technology use (Suchman, 1995). The implementation of risk-based initiatives creates corresponding pressures for communication to demonstrate compliance with these expectations.

Risk-based CDR aligns with March's (1991) concept of organizational exploitation, including refinement and efficiency within established parameters. These initiatives often respond to issues partly covered by regulatory requirements, industry standards, or identified risks that demand organizational attention. The rather defensive nature of risk-based CDR creates a need for both "substantive" (i.e., actually implementing risk-mitigation practices) and "symbolic" (i.e., communicating these practices) management to maintain legitimacy (Ashforth and Gibbs, 1990).

Organizations face significant legitimacy pressures regarding digital risk management, particularly as digital technologies represent areas of heightened public sensitivity. As Carl *et al.* (2024) note, concerns about data privacy and security, as well as product safety and liability, have become focal points of stakeholder attention, intensifying the pressure to demonstrate responsible behavior. Organizations often increase their disclosure when facing legitimacy threats or heightened public scrutiny (O'Donovan, 2002). Communicating about risk-based CDR serves a crucial accountability function; making ethical standards and mitigation procedures transparent contributes to a culture of ethical behavior (Kaptein, 2008). This communication demonstrates to stakeholders that the organization is aware of its responsibilities and is taking concrete steps to address them.

Thus, we propose:

***H₂:** Organizations with higher levels of risk-based CDR implementation will exhibit higher levels of CDR communication.*

The Moderating Role of Observability on Opportunity-Based CDR Communication

Observability is the degree to which stakeholders can perceive organizational actions and their outcomes without deliberate disclosure from the organization (Bernstein, 2012). We argue that observability moderates the relationship between opportunity-based CDR and its communication. Signaling theory posits that signals derive their value from reducing information asymmetry about unobservable qualities (Connelly *et al.*, 2011; Spence, 1973). It logically follows that when an action is already highly observable, the incremental value of a formal communication signal diminishes.

Deliberate disclosure becomes most critical when actions are inherently less visible (Schnackenberg and Tomlinson, 2016). In such cases, organizations can strategically use their discretion in communication to shape the narrative and ensure their proactive efforts are recognized (Lyon and Montgomery, 2015).

Conversely, when opportunity-based CDR initiatives are already visible to stakeholders (e.g., through direct experience or media coverage), extensive communication may be redundant or even counterproductive. Over-communicating about already observable actions risks undermining credibility, as excessive legitimization efforts can paradoxically decrease legitimacy by making the organization seem insecure or even misleading (Ashforth and Gibbs, 1990; Carlos and Lewis, 2018). Moreover, communication implies both direct costs (preparing reports, creating materials) and indirect costs (management time, opportunity costs) that yield diminishing returns when initiatives are already visible. Therefore, the incentive to signal through formal communication is strongest when actions are less likely to be observed on their own.

This leads to our third hypothesis:

H₃: The positive relationship between opportunity-based CDR implementation and CDR communication will be moderated by opportunity-based observability, such that the relationship is weaker under conditions of high observability.

The Non-Moderating Role of Observability on Risk-Based CDR Communication

For risk-based CDR, we expect the relationship between implementation and communication to remain consistent regardless of observability levels. This expectation stems from the fundamental differences in the nature and purpose of risk-based CDR initiatives.

While not equivalent to compliance, risk-based initiatives align more closely with compliance-oriented thinking and regulatory expectations than opportunity-based initiatives. Addressing inherent risks of digital technologies represents a “must-have” rather than “nice-to-have” element of digital responsibility (Hartley *et al.*, 2024; Wirtz *et al.*, 2023). According to Schrödter and Weißenberger (2024), stakeholders such as customers increasingly view digital compliance initiatives as baseline expectations. Additionally, these topics are frequently governed by existing regulatory baselines (e.g., GDPR, mandatory risk reporting). Even when exceeding compliance, standardized processes and expectations already exist for these issues. The communication of these initiatives is therefore not primarily about signaling values but about demonstrating compliance and meeting requirements.

This communication serves essential functions that persist regardless of observability. First, it fulfills a crucial internal and external accountability function by documenting procedures and standards (Kaptein, 2008). Second, given the complexity of digital technologies, clear communication is necessary to ensure the proper implementation of mitigation initiatives by employees (Lobschat *et al.*, 2021). Because the drivers for communicating risk-based CDR (accountability, compliance, internal control) are constant and internally necessary, their visibility to external stakeholders does not reduce the need for their formal communication.

Furthermore, the absence of negative events that often characterizes successful risk-based CDR creates unique communication challenges. Even when stakeholders might observe the absence of data breaches or privacy violations, they cannot necessarily attribute such results to specific organizational efforts without formal communication (Repenning and Sterman, 2001). This attribution problem means that organizations must actively communicate their risk mitigation efforts to receive credit for preventing negative outcomes – again, making observability secondary to the organizational need to communicate compliance.

Therefore, we finally propose:

H₄: *The positive relationship between risk-based CDR implementation and CDR communication will not be significantly moderated by risk-based observability.*

Figure E-1 presents our conceptual model illustrating these proposed relationships between CDR implementation, observability, and communication practices.

In summary, our hypotheses suggest that both opportunity-based and risk-based CDR initiatives drive CDR communication, but the moderating effect of observability differs between these two types of initiatives. For opportunity-based CDR, observability weakens the relationship between implementation and communication, as high observability reduces the signaling value of formal communication. For risk-based CDR, observability does not significantly moderate this relationship, as communication serves essential compliance, legitimacy, and risk management functions regardless of natural observability.

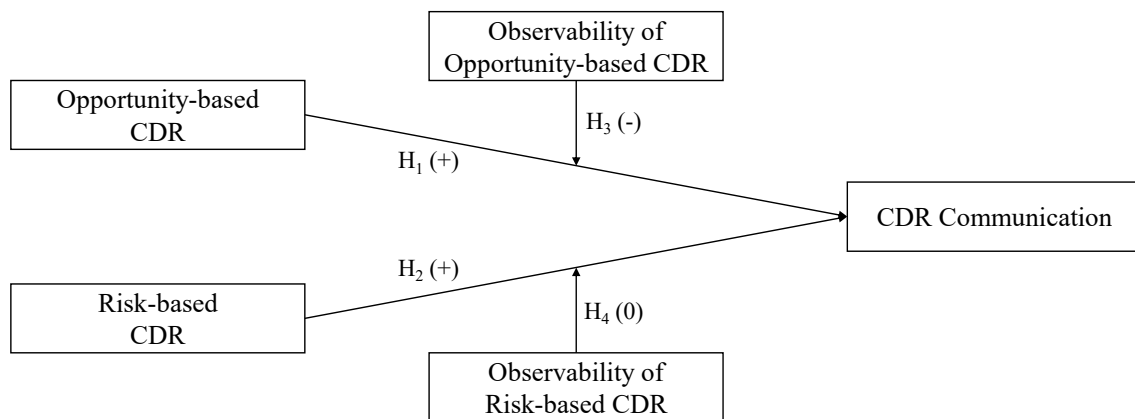


Figure E-1: Conceptual Model of CDR Communication

4 Methodology and Research Design

4.1 Data Collection and Sample

The data used in this study were gathered via telephone surveys with managers from German companies based in North Rhine-Westphalia. The sampling approach deliberately excluded firms from the finance and real estate sectors. Company addresses were obtained exclusively from publicly accessible sources, such as the German commercial register,

the Federal Gazette, and state-level register portals. Initially, 1,208 companies were contacted, of which 718 were successfully reached. A total of 190 managers completed the survey, yielding a response rate of 15.73%, a cooperation rate of 26.46%, and a contact rate of 59.44%. After data cleaning, removing three observations due to their affiliation with ineligible industries, the final dataset comprised 187 observations. The sample comprises strategically relevant respondents: a substantial portion (77.5%) are high-level decision-makers, classified as managing directors or senior management. Furthermore, the majority of the organizations surveyed are small and medium-sized enterprises, with 87.1% of the firms falling into this category (10 to 249 employees). The companies exhibit a broad sectoral distribution, with the largest segments being Trading (25.8%), Service and Consulting (21.5%), and the general Industry category (21.5%). Detailed sample characteristics, including respondents' position, number of employees, and industry classification, are presented in Table E-1.

Table E-1: Sample Characteristics

Characteristic	Frequency	Percentage
<i>Position of Participant</i>		
Managing director and senior management level	145	77.5%
Division manager	25	13.4%
Department manager	16	8.6%
Team leader	1	0.5%
<i>Employees in Company</i>		
Under 10	10	5.4%
10-49	110	59.1%
50-249	52	28%
Over 249	14	7.5%

(continued on next page)

Characteristic	Frequency	Percentage
<i>Industry of Company</i>		
Agriculture and Food Industry	9	4.8%
Construction	7	3.8%
Service and Consulting	40	21.5%
Healthcare	5	2.7%
Trading	48	25.8%
Manufacturing	11	5.9%
Hotel, Gastronomy, and Leisure	12	6.5%
IT, Telecommunications, and Media	12	6.5%
Logistics, Transportation	2	1.1%
Industry	40	21.5%

4.2 Variable Measurement

For our study, we employed consistent six-point Likert scales ranging from “Strongly disagree.” to “Strongly agree.” across all primary constructs.

Dependent Variables: CDR Communication

The dependent variable, CDR communication, was measured by asking participants to indicate whether their company actively communicates its activities related to responsible and sustainable digitalization. This included both internal communication to employees (e.g., via the intranet, company meetings, or newsletters) and external communication to the public, including customers, business partners, and society (e.g., via the website or press releases). The two items were summed to create a composite measure of overall CDR communication.

Independent Variables: Opportunity- and Risk-based Action

To evaluate CDR-related action, we developed scenario-based vignettes describing specific digital responsibility initiatives. Respondents indicated whether they had already implemented comparable initiatives within their organizations, following established procedures in ethical decision-making research (e.g., Buchan, 2005; Carpenter and Reimers,

2005; Feder and Weißenberger, 2019; Flannery and May, 2000; O’Fallon and Butterfield, 2005). The assessment included six distinct scenarios, evenly divided between opportunity-based and risk-based approaches. Opportunity-based vignettes described initiatives such as implementing digital solutions to reduce employee workload and using technologies to analyze and minimize production emissions and waste. Risk-based scenarios included protocols that prevent digital communication after hours to mitigate remote work stress, as well as policies against monetizing customer profiles through advertising sales.

We purposefully created scenarios representing diverse and non-interchangeable aspects of digital responsibility (e.g., environmental, social, and governance-related initiatives) which together determine the action constructs, thereby establishing them as formative (Diamantopoulos and Winklhofer, 2001). This conceptual choice reflects that the various CDR actions are not interchangeable manifestations of a single latent factor; omitting an item from a construct would imply omitting a significant aspect of its domain (Bollen and Lennox, 1991; Diamantopoulos and Winklhofer, 2001). This formative treatment is then empirically supported by the Cronbach’s alpha coefficients (0.56 for opportunity-based action and 0.40 for risk-based action), which fall below the conventional threshold for reflective constructs (Nunnally, 1978). We thus calculated the corresponding scores through a summation of the individual items.

While scenario-based approaches might have limitations regarding generalizability (Randall and Gibson, 1990; Weber, 1992), they are frequently utilized in sustainability research due to the inherent measurement challenges linked to social desirability (O’Fallon and Butterfield, 2005). By focusing on past implementation rather than intentions, we aimed to further mitigate social desirability bias while capturing authentic organizational behavior (McCabe *et al.*, 1996; O’Fallon and Butterfield, 2005).

Moderating Variables: Opportunity- and Risk-based Observability

For opportunity-based observability, participants assessed whether key stakeholders could immediately recognize if the company failed to leverage the socially positive potential of digital technologies and data. Conversely, risk-based observability measured whether stakeholders could immediately recognize irresponsible use of digital technologies or data (Bernstein, 2012; Kaptein, 2008; Schnackenberg *et al.*, 2021).

Control Variables

Our research design incorporated several control variables to account for additional factors potentially influencing CDR implementation, observability, and communication behaviors. We considered the organizational position of participants, recognizing the variation in decision-making authority and information access across hierarchical levels. Company size, quantified by the number of employees, was considered, as larger entities typically face enhanced regulatory and stakeholder demands as well as possess greater resources for implementing and communicating sustainability-related initiatives (e.g., Baumann-Pauly *et al.*, 2013; Lynch-Wood *et al.*, 2009; Wickert *et al.*, 2016). We also incorporated industry classification to account for differences in regulatory frameworks and external scrutiny (Lobschat *et al.*, 2021; Ozdora-Aksak and Atakan-Duman, 2016). Additionally, we measured technology acceptance (Venkatesh *et al.*, 2012) to control for effects based on attitudes toward digital technologies that might influence CDR implementation and communication mechanisms. Finally, we included social desirability measures to control for potential self-reporting biases in assessing ethical business practices (Feder and Weißenberger, 2019; based on Winkler *et al.*, 2006; and Paulhus, 1984), which may occur in telephone surveys due to reduced perceived anonymity (Holbrook *et al.*, 2003).

4.3 Analytical Approach

To analyze the collected data, we used the software STATA. First, we computed descriptive statistics to summarize key constructs. To test our hypotheses, we then conducted multiple ordinary least squares (OLS) regressions, examining CDR communication, both with and without considering observability and control variables.

In preliminary analyses, we detected potential multicollinearity issues when including the interaction terms, with variance inflation factors (VIFs) exceeding 10, a common cutoff threshold (Hair *et al.*, 2010, p. 204; O'Brien, 2007). High VIF values indicate strong correlation between predictors, which can destabilize coefficient estimates and inflate standard errors (Hair *et al.*, 2010, p. 204; O'Brien, 2007). To address these multicollinearity issues, we followed established practices for interaction models by standardizing the independent variables related to action and observability prior to the final analyses (Aiken and West, 1991, pp. 35–36; Cohen *et al.*, 2003, pp. 266–267). This procedure effectively reduced VIFs for all key constructs and their interactions to below 1.87, enhancing our

confidence in the interpretability of the regression coefficients and strengthening the reliability of our findings.

5 Results

5.1 Descriptive Statistics

The descriptive statistics for the constructs are presented in Table E-2. Statistical analysis using paired two-sided *t*-tests reveals several patterns regarding the differences between opportunity-based and risk-based CDR initiatives as well as their observability. The results demonstrate a substantial disparity between the implementation of both CDR types ($t = -3.99, p < .001$), with organizations exhibiting a pronounced tendency toward having implemented risk-based initiatives ($M = 11.73, SD = 3.86$) over opportunity-based initiatives ($M = 10.16, SD = 3.42$). Regarding observability, the results indicate that opportunity-based CDR initiatives ($M = 3.18, SD = 1.30$) are perceived by managers as less observable than risk-based CDR initiatives ($M = 3.42, SD = 1.58$). This difference is more modest but remains significant ($t = -2.43, p < .05$).

Table E-2: Descriptive Statistics of Variables

Variable		<i>N</i>	Mean	SD	Min.	Max.
Action	OB	158	10.16	3.42	3	18
	RB	181	11.73	3.86	3	18
Observability	OB	186	3.18	1.30	1	6
	RB	187	3.42	1.58	1	6
CDR Communication		185	8.52	2.68	2	12

SD: standard deviation, Min.: minimum, Max.: maximum, OB: Opportunity-based, RB: Risk-based.

5.2 Hypothesis Testing

Table E-3 presents the OLS regression results, which examine the determinants of CDR communication. Model 1 establishes the baseline relationships, showing that both opportunity-based action ($\beta = 0.28, p < .001$) and risk-based action ($\beta = 0.17, p < .05$) significantly predict CDR communication. The R^2 of 0.13 indicates that CDR actions alone explain a meaningful portion of communication variance. When control variables are introduced in Model 2, we find a substantial increase in explanatory power ($R^2 = 0.39$). While risk-based action strengthens its significance ($\beta = 0.20, p < .01$), opportunity-based action becomes only marginally significant ($\beta = 0.12, p < .10$). Technology acceptance emerges as a highly significant predictor ($\beta = 0.39, p < .001$), suggesting that managers' comfort with digital technologies strongly influences their CDR communication intensity.

Model 3 incorporates observability constructs and their interactions without control variables. Both action types remain significant (OB: $\beta = 0.22, p < .01$; RB: $\beta = 0.22, p < .01$), and risk-based observability shows a significant positive effect ($\beta = 0.22, p < .05$). The interaction terms, however, do not reach statistical significance. The R^2 of 0.21 represents an improvement over the baseline model. The full Model 4 reveals the most nuanced patterns. Risk-based action shows the strongest effect ($\beta = 0.28, p < .001$), while opportunity-based action loses significance again ($\beta = 0.09, p > .10$). Crucially, the interaction between opportunity-based action and observability becomes significant and negative ($\beta = -0.18, p < .05$), indicating that higher observability weakens the relationship between opportunity-based actions and communication. Technology acceptance maintains its strong positive effect ($\beta = 0.40, p < .001$). The model achieves an R^2 of 0.43.

In summary, our results provide support for H₂, H₃, and H₄, while H₁ receives no support ($p > .10$ in Model 4).

Table E-3: OLS Regression Results

Variable	CDR Communication			
	Model 1	Model 2	Model 3	Model 4
OB Action	0.28***	0.12.	0.22**	0.09
OB Observability	-	-	0.11	0.14
OB Action × OB Observability	-	-	-0.06	-0.18*
RB Action	0.17*	0.20**	0.22**	0.28***
RB Observability	-	-	0.22*	0.04
RB Action × RB Observability	-	-	-0.02	0.04
<i>Position of Participant</i> (Reference: Managing Director and Senior Management Level)				
Division Manager	-	0.12.	-	0.13.
Department Manager	-	0.17*	-	0.16*
Team Leader	-	0.07	-	0.07
<i>Company Size</i>	-	-0.01	-	-0.02
<i>Technology Acceptance</i>	-	0.39***	-	0.40***
<i>Social Desirability</i>	-	-0.05	-	-0.05
<i>Industry Controls</i>	No	Yes	No	Yes
<i>N</i>	154	150	153	149
<i>R²</i>	0.1264	0.3888	0.2119	0.4311

Table E-3 shows the results obtained by OLS regression with CDR communication as dependent variable. Models 1 and 2 include only the action constructs, while Models 3 and 4 additionally incorporate the observability constructs and their interactions with the action constructs. Models 1 and 3 exclude control variables, while Models 2 and 4 include them. The entries represent the standardized coefficients (β), and the respective statistical significance is indicated by . for $p < .10$, * for $p < .05$, ** for $p < .01$ and *** for $p < .001$. OB: Opportunity-based, RB: Risk-based.

6 Discussion

6.1 Discussion of Findings

The Dual Logics of CDR Communication

This study sought to understand why and how organizations communicate their CDR initiatives. Our findings reveal a nuanced and complex picture, suggesting that the drivers of CDR communication are fundamentally dependent on the nature of the underlying actions. The core finding of this paper is that CDR communication does not follow a single, monolithic logic. Instead, it operates along two distinct pathways: the communication of risk-based CDR is governed by a logic of institutional imperative, while the communication of opportunity-based CDR follows a logic of strategic discretion.

Our theoretical framework, which distinguishes between proactive, opportunity-creating “exploration” and defensive, risk-mitigating “exploitation” (March, 1991), is strongly supported by our empirical results. The data clearly demonstrate that these two types of CDR are not merely conceptually different but are associated with fundamentally distinct communication patterns governed by different theoretical mechanisms.

The Institutional Imperative of Risk-Based CDR

Our findings provide robust support for the hypotheses related to risk-based CDR. The positive relationship between risk-based action and communication ($H_2: \beta = 0.28, p < .001$ in Model 4) is strong and remains significant across all models. Crucially, as hypothesized in H_4 and illustrated in the right panel of Figure E-2, this relationship is not moderated by observability (interaction effect: $\beta = 0.04, p > .10$). The statistically parallel lines indicate that the level of communication increases with the level of action, regardless of whether these actions are observable by stakeholders or not.

This provides compelling evidence that the communication of risk-based CDR is not a discretionary strategic choice but an institutional necessity. It aligns perfectly with legitimacy theory, which posits that organizations must demonstrate conformity with societal norms and expectations to maintain their “license to operate” (Suchman, 1995). As digital risks are subject to intense public scrutiny and evolving regulation (particularly in the European context with the GDPR and AI Act), pressure is exerted on organizations, ultimately leading to the institutionalization of practices (DiMaggio and Powell, 1983). The communication itself becomes a “rationalized myth” (Meyer and Rowan, 1977), an

institutionalized practice that organizations must adopt to maintain legitimacy, regardless of its technical efficiency.

Furthermore, this finding strongly supports the concept of the “attribution problem” when prevention succeeds – organizations receive little recognition for problems that never materialize (Repenning and Stermann, 2001). When data breaches do not occur, when algorithms do not discriminate, or when privacy is maintained, this absence of negative events provides no observable evidence of organizational diligence. This makes communication essential for organizations to receive credit for their risk mitigation efforts, particularly as stakeholders increasingly view digital compliance as a “must-be” criterion (Schrödter and Weißenberger, 2024), requiring continuous signaling of adherence to baseline expectations.

The Strategic Discretion of Opportunity-Based CDR

In stark contrast to the institutional imperative governing risk-based communication, our analysis reveals that opportunity-based CDR follows a fundamentally different logic characterized by strategic choice and contextual adaptation. While the main effect loses significance in the full model ($\beta = 0.09, p > .10$), the significant interaction effect ($H_3: \beta = -0.18, p < .05$) unveils a nuanced pattern of strategic communication that varies systematically with observability conditions, as visualized in the left panel of Figure E-2.

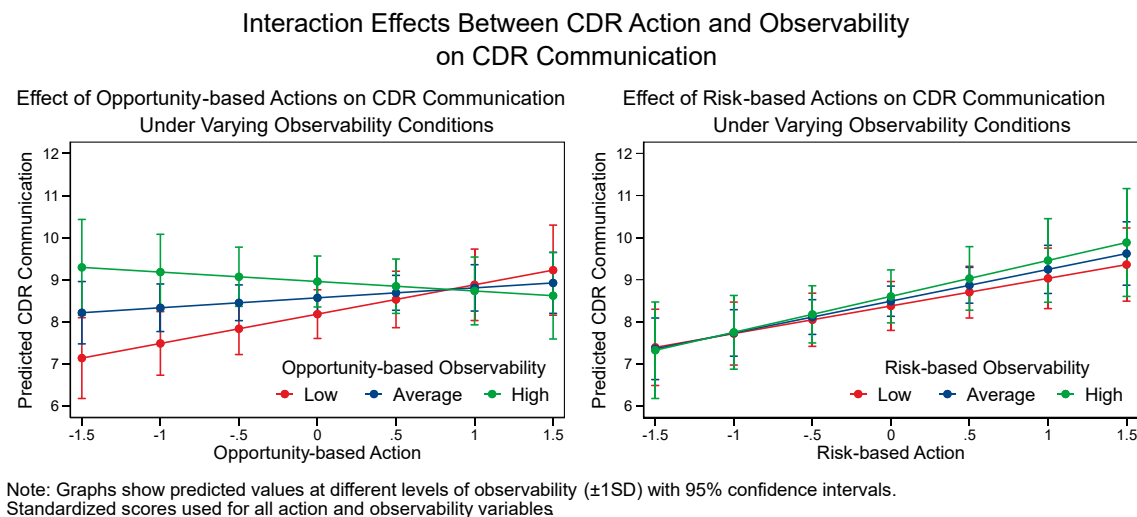


Figure E-2: Visualization of the Moderating Effect of Observability

This pattern reveals three key insights about opportunity-based CDR communication:

First, the main effect loses significance when observability is considered, suggesting that the relationship between opportunity-based action and communication cannot be fully understood without accounting for the observability context. These findings challenge simplistic linear assumptions and confirm that the value of communication signals depends critically on the existing information environment, as Connelly *et al.* (2011) theorized.

Second, the interaction effect reveals contrasting patterns of strategic adaptation. Under conditions of low observability (red line in the left panel of Figure E-2), we observe the classic signaling dynamic: Organizations with higher levels of opportunity-based action engage in progressively more communication. This relationship aligns with traditional signaling theory – when stakeholders cannot observe value-creating initiatives, organizations use communication to bridge information asymmetries. However, under high observability conditions (green line), this relationship fundamentally shifts.

Third, these findings reveal an unexpected inversion of the anticipated pattern. While our hypothesis (H₃) was confirmed through the significant negative interaction effect, the specific manifestation differs from our predictions. We anticipated divergence at high action levels, expecting organizations with observable initiatives to reduce communication following an “actions speak louder than words” logic – reasoning that additional communication might trigger skepticism (Ashforth and Gibbs, 1990; Carlos and Lewis, 2018) or at least incur unnecessary costs. Instead, the findings provide empirical evidence for compensatory symbolic management (Ashforth and Gibbs, 1990). This suggests that organizations use communication as a deceptive tool to bridge the “legitimacy gap” created by visible underperformance. From an ethical perspective, this represents a decoupling of “talk” and “walk” (Wickert *et al.*, 2016), where intensive communication serves as a cover-up rather than a transparent signal of quality.

6.2 Theoretical Implications

This study makes several important contributions to theory. First, by conceptualizing and empirically demonstrating the duality of CDR, we challenge monolithic views of corporate responsibility communication. We show that future research must distinguish between the logics of legitimacy and strategy to accurately model and understand why and how firms communicate. Second, we provide empirical evidence for the simultaneous

operation of signaling and legitimacy theories within a single phenomenon. Rather than viewing these as competing explanations, our study demonstrates their complementary nature: signaling theory best explains proactive communications where organizations have strategic discretion, while legitimacy theory governs defensive communications where institutional pressures dominate. This theoretical integration offers a more complete understanding of why organizations communicate about their responsibility initiatives. Third, the identification of observability as a critical boundary condition advances transparency research. Our study provides quantitative evidence for how observability shapes communication strategies differentially across initiative types. This finding suggests that future research on organizational transparency must consider not just the level of natural visibility but also how it interacts with the nature of organizational actions.

6.3 Practical Implications

Our findings suggest several considerations for managers developing CDR communication strategies. First, the persistent effect of risk-based CDR on communication regardless of observability indicates that managers may benefit from maintaining comprehensive disclosure protocols about risk mitigation. Since stakeholders appear to expect such communications as baseline requirements, reducing them even when actions are highly visible could create legitimacy concerns. Second, the moderating role of observability for opportunity-based CDR reveals a potential communication pitfall. Our findings show that when actions are highly observable, the relationship between implementation and communication weakens. This suggests that some organizations may communicate extensively about opportunity-based initiatives despite limited actual implementation when stakeholders can observe the underperformance. Managers should be aware that such misalignment between visible (in)action and communication intensity may damage credibility and stakeholder trust. Finally, our results highlight that managers face different communication imperatives for different CDR types. Recognizing these distinct logics – institutional pressures for risk-based communication versus strategic considerations for opportunity-based initiatives – may help managers allocate communication resources more effectively and set appropriate expectations for communication outcomes.

6.4 Limitations

We acknowledge multiple limitations that suggest directions for future research. First, our reliance on cross-sectional survey data limits causal inference. While we demonstrate associations between CDR actions, observability, and communication, longitudinal designs could better establish temporal precedence and causality. Second, the use of scenario-based vignettes introduces potential abstraction from actual organizational contexts. Future studies could provide further evidence using archival data from corporate reports, press releases, and social media communications to validate the patterns we identify through managerial perceptions. Third, our reliance on telephone surveys and self-reported measures may introduce social desirability bias (Podsakoff *et al.*, 2003), as the reduced anonymity of interviewer-administered formats can encourage socially acceptable responses (Holbrook *et al.*, 2003). Although we controlled for social desirability using validated scales and found no significant effects, such controls may not fully eliminate this bias. Finally, our sample's composition – predominantly small and medium-sized enterprises (87.6% under 250 employees) from a single German state – may limit generalizability. Smaller companies face different resource constraints and stakeholder pressures than large corporations (Lobschat *et al.*, 2021), potentially affecting their communication strategies. Comparative studies across firm sizes and geographic contexts could reveal whether our findings represent universal patterns or context-specific phenomena.

7 Conclusion

This study reveals that CDR communication follows fundamentally different patterns depending on the nature of the underlying initiatives. By distinguishing between opportunity-based and risk-based CDR, we uncover two distinct communication logics that challenge monolithic approaches to understanding corporate responsibility disclosure. Our findings demonstrate that risk-based CDR communication operates under an institutional imperative, driven by legitimacy maintenance requirements that persist regardless of action observability. Organizations consistently communicate their digital risk mitigation efforts to demonstrate compliance with societal expectations, addressing the attribution problem inherent in preventing negative outcomes. In contrast, opportunity-based CDR communication reflects strategic discretion, with observability fundamentally altering the action-communication relationship. We uncover an unexpected pattern where

organizations with minimal but observable opportunity-based initiatives engage in intensive communication – suggesting compensatory symbolic management when underperformance is visible.

These insights advance theory by demonstrating how established frameworks operate differently in digital responsibility contexts. While legitimacy theory governs defensive CDR communication, signaling theory explains proactive communication but with important boundary conditions introduced by observability. Our work highlights that treating CDR as a unified construct masks these critical differences, potentially leading to misaligned communication strategies and missed opportunities for strategic differentiation. As organizations navigate an increasingly digital future, understanding these distinct communication imperatives becomes essential for effective stakeholder engagement and competitive positioning in the digital responsibility landscape.

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Appendices

Appendix E-I: Questionnaire Items for the Communication and Transparency Variables

Variable	Items
Communication_Int^a	My company actively communicates its activities in the field of responsible and sustainable action related to digitalization internally to employees (e.g., via the intranet, company meetings, or newsletters).
Communication_Ext^a	My company actively communicates its activities in the field of responsible and sustainable action related to digitalization to the public, including customers, business partners, and society (e.g., via the website or press releases).
Transparency OB^a	Our key stakeholders can immediately recognize if we fail to leverage the socially positive potential of digital technologies and data.
Transparency RB^a	Our key stakeholders can immediately recognize if we do not act responsibly in our use of digital technologies or data.

^a Six-point Likert scale “Strongly disagree.” to “Strongly agree.”.

Appendix E-II: Questionnaire Item and Vignettes for the Action Constructs

Variable	Items
Action^a	I have already implemented similar initiatives in my company.
Focus	Vignettes
OB	- In production, digital technologies are used to support employees in their work, significantly reducing their workload. The necessary hardware and software incurred substantial costs. - An internal project is initiated, in which digital technologies are used to analyze and reduce emissions and waste in production. In the first few years, the implementation costs exceed the cost savings. - Blockchain technology is used to create greater transparency along the value chain to exclude unfair conditions in the supply chain. Due to the complexity of the technology, this involves considerable effort.
RB	- A new working time concept is introduced, whereby, among other things, emails and phone calls are not delivered to employees between 8:00 p.m. and 6:00 a.m. to prevent stress and overload from constant availability during remote work. This is accompanied by a reduction in productivity. - Digital technologies with significant energy consumption are used. Therefore, the company switches to electricity from renewable sources, resulting in noticeably higher electricity costs. - Customer profiles are not sold to other companies for advertising purposes, which means forgoing a noticeable profit.

^a Six-point Likert scale “Strongly disagree.” to “Strongly agree.”.

Appendix E-III: Questionnaire Items for the Control Variables

Variable	Items
Position^a	What is your position in the company? - Managing director and senior management level - Division manager - Department manager - Team leader - Employee without a managerial position
Technology Acceptance^b	How do you personally rate the following statements? - With the help of digital technologies, I can make decisions or complete tasks faster. - It usually does not take me long to acquire skills in digital technologies. - I enjoy using digital technologies. - I have the necessary knowledge to use digital technologies. - People whose opinions are important to me advise me to use digital technologies. - I intend to use more digital technologies in the future.
Social Desirability^c	How do you personally rate the following statements? - I have received too much change from a salesperson without telling him or her - I am always honest with others. - There have been occasions when I have taken advantage of someone

(continued on next page)

Variable	Items
Industry ^a	What industry does your company operate in?
	- Agriculture and Food Industry
	- Construction
	- Service and Consulting
	- Healthcare
	- Trading
	- Manufacturing
	- Hotel, Gastronomy, and Leisure
	- IT, Telecommunications, and Media
	- Logistics, Transportation
	- Industry
	- Other: (please specify)
Employees in Company	How many employees does your company have?

^a Simple Choice.

^b Six-point Likert scale “Strongly disagree.” to “Strongly agree.”, items based on Venkatesh *et al.* (2012).

^c Six-point Likert scale “Does not apply at all.” to “Applies completely.”, items from Feder and Weißenberger (2019), based on Winkler *et al.* (2006) and Paulhus (1984).

F Affidavit

Ich, Armando Schrödter, versichere an Eides statt, dass die vorliegende Dissertation von mir selbstständig und ohne unzulässige fremde Hilfe unter Beachtung der „Grundsätze zur Sicherung guter wissenschaftlicher Praxis an der Heinrich-Heine-Universität Düsseldorf“ erstellt worden ist.

Köln, 25. Februar 2026

Armando Schrödter