RESEARCH ARTICLE

Navigating the digital frontier: Unveiling the dimensions of corporate digital responsibility practice

Anna Wannhoff

Munich Business School,
Elsenheimerstr. 61, 80687 Munich,
Germany,
anna.wannhoff@munich-business-school.de

Markus Westner

OTH Regensburg, Seybothstraße 2,
93053 Regensburg, Germany,
markus.westner@oth-regensburg.de

Abstract

This paper conducts an in-depth review of the last five years of Corporate Digital Responsibility (CDR) research, aiming to define CDR practices through a systematic literature review and grounded theory. The study identifies six aggregate dimensions of CDR practices: organisational culture, stakeholder engagement, ethical and responsible use of technology, governance and compliance, digital literacy and education, and innovation and future readiness. These dimensions are derived from 52 selected studies, yielding 180 coded insights. The paper highlights the importance of these dimensions in assessing and understanding companies' CDR practices and proposes a research agenda to address existing gaps in the literature. The findings provide a foundational framework for both researchers and practitioners to evaluate and enhance CDR dimensions, contributing long-term to the development of a framework or model to measure and evaluate CDR practices. This framework or model aims to guide strategic CDR initiatives and foster responsible digital practices in the evolving digital landscape.

1. Introduction

The rapid advancement of digitalization has profoundly reshaped business operations and strategic orientations - a phenomenon widely known as digital transformation (Ngereja et al., 2024). However, these advancements are accompanied by emerging challenges, particularly ethical concerns related to data governance and privacy, which extend beyond individual organisations to impact a broad range of stakeholders (Xu et al., 2018). Addressing these complexities requires a comprehensive approach to managing digital transformation in a responsible, ethical, and sustainable manner (Saeed et al., 2023).

In this context, Corporate Digital Responsibility (CDR) has emerged as a management concept, building upon the foundation of Corporate Social Responsibility (CSR) (Herden et al., 2021). CDR refers to a company's responsibility in the digital society (Mueller, 2022). It involves voluntary commitments to sustainable business practices that consider the societal and economic changes brought about by digital transformation (Lobschat et al., 2021). CDR aims to balance the benefits of digital transformation with ethical practices, ensuring transparency in data processing, responsible use of artificial intelligence, and sustainable digital operations (Esselmann et al., 2020). It is an extension of CSR, focusing specifically on digital aspects, such as data privacy, cybersecurity, and governance (Doerr, 2021).

As organizations increasingly navigate the complexities of digital transformation, CDR has become a critical concept for guiding responsible business practices in the digital age (Doerr, 2021). This concept addresses the ethical, social, and environmental challenges posed by digital technology in a corporate context, ensuring that companies act responsibly while harnessing the power of technology (Lobschat et al., 2021). The growing relevance of CDR makes it a timely and essential area of research, as companies must balance technological advancement with the broader values of transparency, accountability, and sustainability (Herden et al., 2021).

Research on CDR has grown rapidly since 2019, particularly in information systems (IS) literature (Bednárová & Serpeninova, 2023). Current research focuses on defining CDR concepts and theoretical foundations, with increasing interest in practical implementation (Angermann, 2023). Studies examine how companies incorporate digital ethics into their strategies (Lobschat et al., 2021; Altmeppen & Filipović 2019; Jones & Comfort, 2021; Kunz et al., 2024). However, there is limited research on the fundamental dimensions of CDR practices, crucial for analysing long-term impacts.

This paper presents an in-depth review of the last five years of CDR research. It categorises existing literature reviews into three phases (pre-adoption, adoption, and post-adoption) to identify initial research gaps (RQ1). Building on this, a systematic literature review (SLR) was conducted, reviewing 52 studies on CDR from 2020 to 2024 using an inductive method to define relevant dimensions of CDR practices (RQ2). The findings were synthesised, identifying further research gaps and summarising them in a research agenda (RQ3).

This research paper has three main outcomes and contributions: first, this research paper provides an in-depth overview of the current state of knowledge on CDR by building upon prior studies that primarily defined the terminology for CDR (Mueller, 2022; Wynn & Jones, 2023; Carl & Hinz, 2024; Cheng & Zhang, 2023; Herden et al., 2021; Jones & Comfort, 2021; Kempkes et al., 2022; Knopf & Pick, 2023; Lobschat et al., 2021; Londoño-Cardozo & Paz, 2021) and emphasized its conceptual differences from CSR (Van der Merwe & Al Achkar, 2022; Orbik & Zozuľaková, 2019; Covucci et al., 2024). Second, it uses grounded theory to build a thematic map that inductively classifies and describes relevant dimensions of CDR practices, based on a systematic and structured analysis. The analysis of these dimensions uncovers six aggregate dimensions and 23 second order themes across current literature that shed light on the scope, contextualisation and measurability and of each dimension. Both researchers and practitioners can leverage these aggregate dimensions and second order themes to facilitate a culture of accountability and ongoing enhancement, while also gaining a deeper understanding of CDR in general and the challenges associated with implementing CDR in practice. Third, by summarizing

the central papers and providing a thorough overview of CDR research in its entirety, emerging trends and promising further avenues in the research field of CDR are identified and summarized in a research agenda.

The paper is organised as follows: Chapter 2 gives an overview of prior research on CDR research. Chapter 3 details the study's methodology. Chapter 4 summarises data collection and analysis, presenting research results and identifying CDR practice dimensions. Chapter 5 discusses findings and proposes a research agenda, with Chapter 6 concluding the paper.

2. Background and related work

2.1. Conceptual foundations of CDR

CDR as a concept is grounded in several theoretical foundations that intersect business ethics, corporate governance, and information and communication technologies (ICT) (Herden et al., 2021). Initially rooted in the broader framework of CSR, which emerged prominently in the 1970s to address social and environmental issues arising from globalization, industrialization, and consumerism, CDR has evolved to address the specific ethical and societal challenges posed by the pervasive digital transformation in contemporary business environments (Munro, 2020; Kaidalova et al., 2018). While CSR and CDR partly overlap in the sense of joint goals and addressing social and environmental issues, CDR concentrates on the particular risks and intricacies presented by a digital environment, as well as the significantly more intricate responsibilities that arise from the use of digital technologies (Lobschat et al., 2021).

Over the past few years, the idea of CDR has significantly advanced and garnered considerable attention in the corporate world. It is now viewed as a critical factor for all economic stakeholders when formulating their sustainable development strategies (Rugeviciute, 2023). However, academic research on this concept is still in its infancy. Compared to CSR, CDR is less universally embraced and lacks the same level of standardization through frameworks and regulations, necessitating ongoing introspection and innovation (Marengo, 2023). The primary reason for this is that CDR is often perceived as a voluntary obligation, encompassing adherence to legal mandates and reflecting the core values that guide an organization's conduct (Merbecks, 2024). As a result, the level of awareness for and development of CDR strategies varies between countries.

One of the countries that has been actively promoting and implementing CDR strategies is Germany, which is currently considered as a leader in this field (Bednárová & Serpeninova, 2023). The German CDR Initiative, which was initiated by the German Federal Ministry of Justice (BMJ) in May 2018, represents a proactive and comprehensive approach to managing the ethical challenges posed by digital transformation (CDR Initiative, 2023). The initiative encourages companies to voluntarily commit to nine guiding principles in their digital practices to foster a collaborative environment where businesses, policymakers, and other stakeholders work together to create a more responsible digital economy (CDR Initiative, 2023).

2.2. Previous literature reviews of CDR research

To understand the constraints of current academic discourse on CDR, this paper examines previous literature reviews on CDR. Using the methodology of Ribeiro et al. (2021) and Rugeviciute (2023), 28 literature reviews from Scopus and Google Scholar (2019-2024) were classified by discussion topics and adoption phases (see Table 1). The dataset, which can be accessed in Appendix A, focuses on business, management, and economics articles. Categorising research by adoption phase helps researchers and practitioners monitor CDR development and identify gaps in the discourse. This approach is particularly useful for emerging research fields, providing insights into how companies integrate CDR into their operations.

Table 1. Categorisation of previous CDR literature review findings by adoption phases and discussion topics

Phase	Discussion topics	Representative literature review contributions from sample
(1) Pre-adoption	1.1 CDR conceptualization	1.1 (Bednárová & Serpeninova, 2023; Mueller, 2022; Carl & Hinz, 2024; Cheng & Zhang, 2023; Herden et al., 2021; Jones & Comfort, 2021; Knopf & Pick, 2023; Lobschat et al., 2021; Londoño-Cardozo & Paz, 2021)
	1.2 CSR vs. CDR	1.2 (Van der Merwe & Al Achkar, 2022; Orbik & Zozuľaková, 2019; Covucci et al., 2024)
	1.3 CDR dimensions	1.3 (Herden et al., 2021; Lobschat et al., 2021; Ivancic & Giermindl, 2023, Mihale-Wilson et al., 2022; Wynn & Jones, 2023)
	1.4 Motivating factors	1.4 (Altmeppen & Filipović 2019; Ivancic & Giermindl, 2023)
	1.5 Risk assessment and management	1.5 (Carl, 2023)
	1.6 CDR readiness and organisational mindset	1.6 (Lobschat et al., 2021; Wynn & Jones, 2023)
	1.7 CDR awareness and understanding	1.7 (Lobschat et al., 2021; Mueller, 2022)
(2) Adoption	2.1 CDR implementation strategies	2.1 (Jones & Comfort, 2021; Wirtz et al., 2023)
	2.2 Digital governance and accountability	2.2 (Jelovac et al., 2022)
	2.3 Data privacy and security	2.3 (Carl, 2021; Carl, 2023; Volkov & Sidorenko, 2022)
	2.4 Sustainability and environmental impact	2.4 (Wilkinson, 2023)
	2.5 Data and AI	2.5 (Aldboush & Ferdous, 2023; Elliott et al., 2021; Kunz & Wirtz, 2023; Wagener, 2022)
	2.6 Governance and frameworks	2.6 (Breivogel, 2024)
(3) Post-adoption	3.1 Monitoring and evaluation	3.1 (Carl, 2021; Wirtz et al., 2023)
	3.2 Impacts and benefits	3.2 (Herden et al., 2021)
	3.3 Reporting and communication	3.3 (Lobschat et al., 2021)

2.2.1 Pre-adoption phase of CDR research

During the pre-adoption stage of CDR, literature reviews focus on raising awareness and establishing a foundational understanding within organisations. Most reviews concentrate on conceptualising CDR (1.1), comparing it with CSR (1.2), and defining its dimensions (1.3) (see Table 1).

Researchers have contributed to understanding CDR by aiding its conceptualisation (1.1) (Bednárová & Serpeninova, 2023; Mueller, 2022; Carl & Hinz, 2024; Cheng & Zhang, 2023; Herden et al., 2021; Jones & Comfort, 2021; Knopf & Pick, 2023; Lobschat et al., 2021; Londoño-Cardozo & Paz, 2021). Although the conceptual framework is developing, a clear and consistent definition is still needed. Appendix B presents selected definitions and conceptualisations from current literature, adapted from Mueller (2022) and Knopf and Pick (2023).

Current CDR definitions highlight two main areas: digital ethics, ensuring accountability in social, economic, technological, and environmental aspects (Lobschat et al., 2021; Cheng & Zhang, 2023; Herden et al., 2021), and governance, establishing a framework for adhering to norms and values at various organisational levels (Carl & Hinz, 2024; Mueller, 2022; Lobschat et al., 2021). Most definitions are generic, often lacking specific activity scopes. They agree that CDR extends beyond legal regulations, rooted in corporate culture, which may need further clarification (Knopf & Pick, 2023); (Mueller, 2022). This study will define CDR by focusing on concrete actions like ensuring data transparency during processing, differentiating it from CSR.

> *CDR refers to a company's responsibility in the digital society. It involves voluntary commitments to sustainable business practices that consider the societal and economic changes brought about by digitalization. CDR aims to balance the benefits of digital innovation with ethical practices, ensuring transparency in data processing, responsible use of artificial intelligence, and sustainable digital operations. It is an extension of CSR, focusing specifically on digital aspects.*

Literature reviews differentiate CDR from CSR, highlighting unique aspects and overlaps (1.2). Van Der Merwe and Al Achkar (2022) argue that while CSR addresses broader societal and environmental responsibilities, CDR focuses on the ethical use of digital technologies and data. They emphasize the need for a comprehensive approach to manage data responsibly. Orbik and Zozuľaková (2019) link CSR and digital transformation, highlighting CDR's importance. Covucci et al. (2024) propose combining Digital Sustainability (DS) and CDR into Corporate Digital Sustainability (CDS) to manage digital sustainability and promote responsible advancement.

Moreover, owing to its novelty, many researchers dedicated considerable effort and resources to exploring the various dimensions of CDR (1.3) (Lobschat et al., 2021; Ivancic & Giermindl, 2023; Mihale-Wilson et al., 2022; Wynn & Jones, 2023). Herden et al. (2021) categorise CDR into digital ethics and governance. Ivancic and Giermindl (2023) emphasize the need for proper governance, risk management, and compliance frameworks for digital technologies and AI. They suggest that CDR encompasses economic, ecological, social and technical dimensions, extending the traditional triple-bottom line to a quadruple-bottom line.

Altmeppen and Filipović (2019) highlight factors motivating stakeholders to adopt CDR strategies (1.4), including ethical considerations, regulatory compliance, reputation management, corporate governance, and competitive advantage. Other researchers focus on risk assessment methods for companies adopting CDR strategies (1.5), identifying risks related to data privacy, cybersecurity, ethical AI usage, and digital governance (Carl, 2023). Few studies systematically structure and identify these specific risks (Wynn & Jones, 2023).

Additionally, research on frameworks to assess companies' readiness (1.6) and awareness (1.7) for CDR is limited. Some frameworks evaluate readiness for digital transformation, closely related to CDR (1.6), covering dimensions like people, technology, processes, customers, and strategy (Lobschat et al., 2021). Wynn and Jones (2023) suggest using qualitative and quantitative metrics, such as employees' digital skills, digital infrastructure, governance policies, and stakeholder involvement. Customizing assessment approaches for each industry is essential due to varying CDR readiness (Lobschat et al., 2021).

Conceptual frameworks for CDR awareness (1.7) include ethical awareness, data privacy, cybersecurity, and responsible digital technology use (Lobschat et al., 2021). Surveys and questionnaires gauge employees' and management's knowledge and attitudes towards CDR principles. However, self-assessment questionnaires' subjective nature and inconsistent data quality pose challenges, prompting calls for standardized and objective measurement tools (Mueller, 2022).

2.2.2   Adoption phase of CDR research

The adoption phase of CDR research primarily focuses on how to implement and integrate responsible digital practices within corporations. Researchers have examined CDR implementation (2.1) across various industries and technological contexts, including digital governance (2.2) (Jelovac et al., 2022), data privacy (2.3) (Carl, 2021; Carl, 2023; Volkov & Sidorenko, 2022), sustainability (2.4) (Wilkinson, 2023), and AI (2.5) (Aldboush & Ferdous, 2023; Elliott et al., 2021; Kunz & Wirtz, 2023; Wagener, 2022). However, there is a notable deficiency in empirical studies and methodologies that support decision-making and governance concerning CDR (2.6) during the adoption phase. The core of this problem lies in the lack of a shared comprehension regarding the extent of CDR (Kunz & Wirtz, 2023), as discussed in the prior chapter.

While many frameworks emphasize conceptual understanding over practical application, Jones and Comfort (2021) offer recommendations for effectively implementing CDR (2.1). These include integrating CDR into corporate strategy, engaging stakeholders, ensuring transparency and accountability, providing ongoing education and training, and maintaining diligent monitoring and reporting. Effective CDR implementation often requires an interdisciplinary approach, combining insights from business ethics, IS, and corporate governance (Wirtz et al., 2023). This holistic perspective helps organisations navigate the multifaceted nature of CDR. Additionally, current literature reviews emphasize the need to cultivate distinct competencies for CDR, encompassing digital ethics, data governance, and stakeholder engagement skills (Breivogel, 2024). Challenges in implementing CDR include the absence of unified metrics, the complexity of digital ecosystems, and organizational reluctance to change. Overcoming these hurdles necessitates regulatory support, organizational dedication, and continuous learning (Breivogel, 2024).

There remains a scarcity of empirical research offering specific data on how companies are adopting CDR practices. This is due to the theoretical nature of much current literature, the broad scope of issues encompassed by CDR, and the underdevelopment of reliable measurement tools, making it challenging to evaluate the effectiveness of CDR initiatives.

2.2.3   Post-adoption phase of CDR research

The post-adoption phase of CDR research primarily focuses on how corporations integrate and sustain responsible digital practices after initial implementation. Research for this phase is limited, with few scholars delving into them, thereby restricting the understanding of the long-term success of implemented CDR strategies. Some literature reviews have proposed first guidelines for monitoring CDR activities and evaluate their effectiveness (3.1) (Carl, 2021; Wirtz et al., 2023). While Carl (2021) identified eight dimensions of CDR and associated sub-dimensions, emphasizing the need for a strategic approach to CDR implementation, Wirtz et al. (2023) highlighted the impact of AI for CDR and the benefits of building a strong CDR culture.

However, only a limited number of literature reviews have proposed specific guidelines for evaluating the impact and benefits of CDR strategies (3.2) (Herden et al., 2021), as well as concrete reporting mechanisms and communication strategies for different stakeholders (3.3) (Lobschat et al., 2021). The literature review of Herden et al. (2021) firstly emphasized the need for a strategic approach to CDR implementation, based on the perceived opportunities and threats associated with digitalisation. Lobschat et al. (2021) examined how to convert CDR into practical guidelines for organizations and various stakeholders, initiating first CDR-related communication mechanisms within an organisational framework.

2.2.4   Identified research gaps in CDR research

While CDR research has sparked significant discussion, several gaps and challenges remain. In the pre-adoption phase, there is a lack of frameworks to assess companies' readiness and awareness for CDR, with current research relying on subjective self-assessment questionnaires. During the adoption phase, empirical studies and methodologies to support decision-making and governance are deficient, with a need for more interdisciplinary approaches and concrete strategies.

In the post-adoption phase, research is limited in exploring the long-term success and sustainability of CDR strategies, with few studies offering guidelines for monitoring, evaluating impact, and developing standardized reporting mechanisms.

Over the past decade, most research has focused on the pre-adoption and adoption phases, understandable given CDR's nascent nature. This diversity complicates creating a cohesive framework for post-adoption research. Rapid technological advancements also pose challenges for longitudinal studies and consistent data collection. Future studies should focus on the post-adoption phase to understand the long-term impacts of CDR practices and identify standardized indicators and metrics.

Before assessing long-term impacts, it is essential to understand CDR dimensions within an organisational context. Although various perspectives have been explored in the pre-adoption phase, research on specific CDR dimensions remains limited. RQ2 aims to address this gap by conducting a systematic literature review (SLR) to identify relevant concepts, themes, and dimensions of CDR practices in an organisational setting.

3. Methodology

SLRs are widely used in evidence-based practice, policy making, and academic research for their comprehensive and objective overview of current knowledge (Fisch & Block, 2018). This is particularly advantageous for identifying gaps within the dynamic and heterogenous body of CDR literature. The SLR was conducted in adherence to Okoli and Schabram's (2015) SLR guidelines, using the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework for data selection, and incorporating the recommendations of Fisch and Block (2018) and Booth et al. (2021) to guarantee the review's high quality.

This SLR uses a scoping and descriptive method to evaluate existing CDR literature, aiming to develop an overview of dimensions of CDR practices, and establish a research agenda for future investigations to address remaining research gaps. For the purpose of data collection, three different electronic databases were used to run the preselected search query: Business Source Premier (EBSCO), Google Scholar, and Scopus. Acknowledging that CDR research is still in its early stages, the researcher has chosen to incorporate various journals and source types (e.g. journals, books, and conference proceedings) while intentionally excluding ongoing studies to provide a comprehensive overview of the subject. The dataset encompassed the timeframe of 2020 to 2024 and specifically concentrated on articles pertinent to business, management, or economics to eliminate unrelated publications.

Concerning the construction of search parameters, a variety of keyword combinations were selected that included "Corporate Digital Responsibility", "Digital Responsibility", and the combined terms "Digital Responsibility" AND "Corporate". As recommended by Knopf and Pick (2023), using queries such as "Digital Responsibility" and "Digital Responsibility AND Corporate" helps to overcome the constraints of sentence construction in abstracts while also encompassing literature on Digital Responsibility beyond the corporate sphere. The search parameters were designed to be broad to cover all aspects of CDR that could be pertinent to understanding the various dimensions of CDR practices. Narrowing the search to keywords like "Corporate Digital Responsibility Practices" would have limited the scope and produced fewer results. In order to account for publications where the full text was not accessible, the search was limited to publication titles and the "include citations" search feature was deactivated. In addition to executing search queries across the three electronic databases, the researcher conducted a manual examination of CDR literature within the top management and IS journals, specifically the AIS Basket of Eight, which refers to a collection of the top academic journals in the field of IS, curated by the Association for Information Systems (AIS) (Mazaheri et al., 2020).

The initial search in July 2024 yielded 950 publications. After review, only a small portion was relevant. The final selection of pertinent articles was based on their relevance to CDR practices, following a structured, multi-step process in line with PRISMA guidelines to ensure transparency and comprehensiveness. The procedure and its related samples are illustrated in Figure 1.
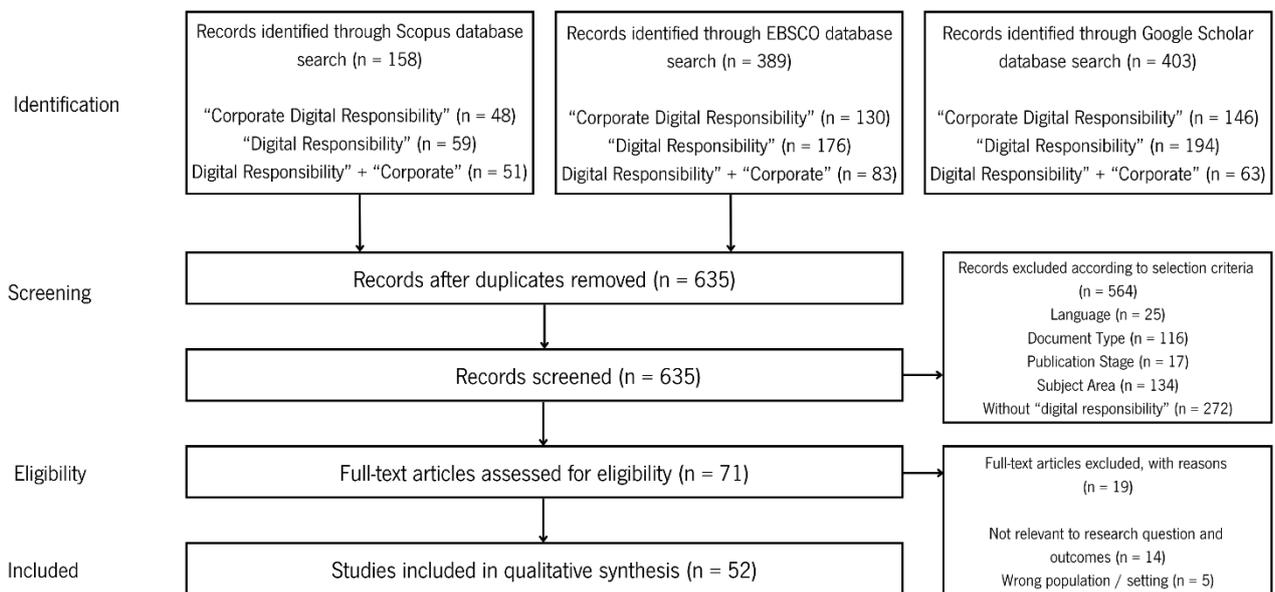
Fig. 1. PRISMA Flow Diagram (own illustration adapted from Moher et al. (2009)).

Following the exclusion of duplicates, a screening of titles, abstracts, and keywords was performed to assess suitability. Utilizing predefined selection criteria, 564 publications were excluded, resulting in a refined sample set of 71 studies. Subsequent to these procedures, the remaining publications were thoroughly reviewed and categorized. Only studies that explicitly focused on CDR and were pertinent to the research outcomes of RQ2, with the aim of defining relevant dimensions of CDR practices, were considered for the final selection. Any study that did not directly relate to "Digital Responsibility" was not included. Employing this criterion, 52 papers met all the necessary conditions and were incorporated into the final sample.

Based on the guidance of Nadkarni and Pruegl (2021), along with Webster and Watson (2002), the literature categorisation and analysis were centred around concepts, themes and dimensions. Hence, to lay the groundwork for the preliminary coding process, every paper chosen underwent review to ascertain specific details including authors, publishing year, article title, outlet, research methodology, geographic region, and key insights (see full database in Appendix C). Subsequently, the coding process commenced, entailing multiple phases to methodically examine and decipher the data. First, the data was segmented into distinct elements (first order concepts) to meticulously scrutinize it for recurring themes, patterns, and classifications (open coding) (Hernandez, 2009).

Second, the data was reorganized in second order themes to establish links between the categories that emerged from open coding, a process known as axial coding. Third, the second order themes are assigned to aggregate dimensions (selective coding), which serve as the main anchors for all related categories and enhance theory development, signifying the apex of abstraction in the overall coding process (Nadkarni & Pruegl, 2021). The coding process is visualized in Appendix D.

4. Results

While CDR is an evolving field that integrates responsible digital practices into corporate strategies, the 52 studies incorporated in the final sample of this SLR provide initial insights and evidence regarding the practical application of CDR within an organisational context. Some of the key insights on how to apply CDR in practice include a holistic approach, as CDR spans social, economic, technological, and environmental areas. Integrating these aspects under the organisational umbrella ensures a consistent and complementary approach. Using the previously outlined coding process, the different characteristics and application areas of CDR practices were systematically analysed and condensed into 23 second order themes, and six aggregate dimensions. Within the scope of this research, we define dimensions as overarching thematic categories that group related practices, principles, or organizational activities under a common conceptual umbrella (Jelovac et al., 2022). Each dimension represents a distinct but interrelated area of CDR that captures specific aspects of how organizations approach, implement, and sustain responsible digital practices across different phases of adoption.

4.1. Descriptive statistics of sample

Prior to delving into the coding process results, a brief description of the sample's study characteristics will be provided (see full database in Appendix C). In this dataset, the majority of research originates from Germany (18 studies), with a substantial number coming from the United Kingdom (6 studies) (see Figure 2).
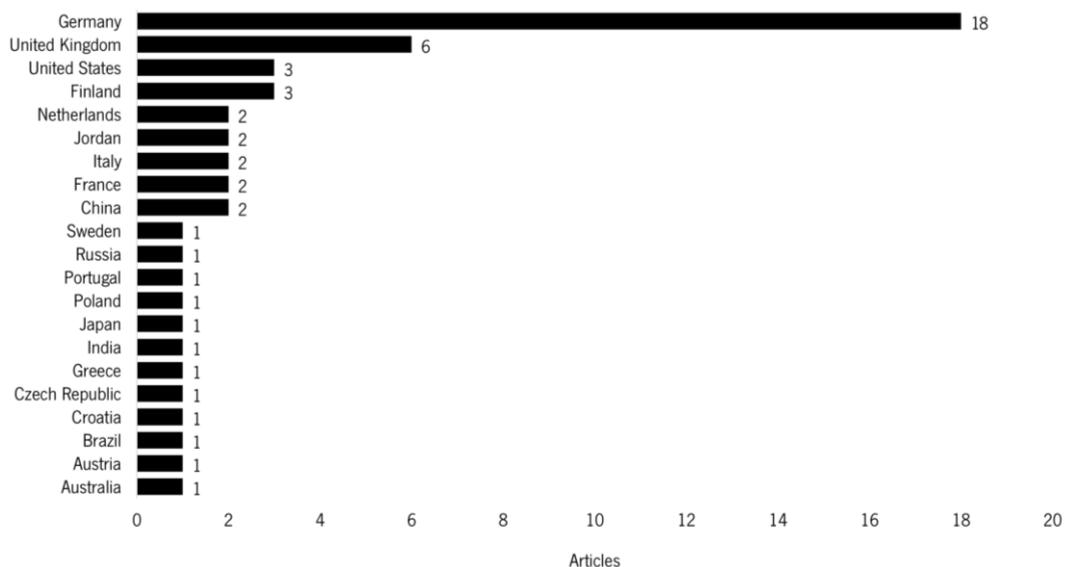

Fig. 2. Number of published articles by region in CDR literature sample

Around three-quarters (75%) of these publications pertain to IS research, whereas the remaining quarter (25%) provides a wider managerial outlook on CDR. The evaluated studies cover a time frame from 2020 to 2024, with about 75% of papers emerging in the past two years, reflecting the novelty of the CDR concept (see Figure 3).
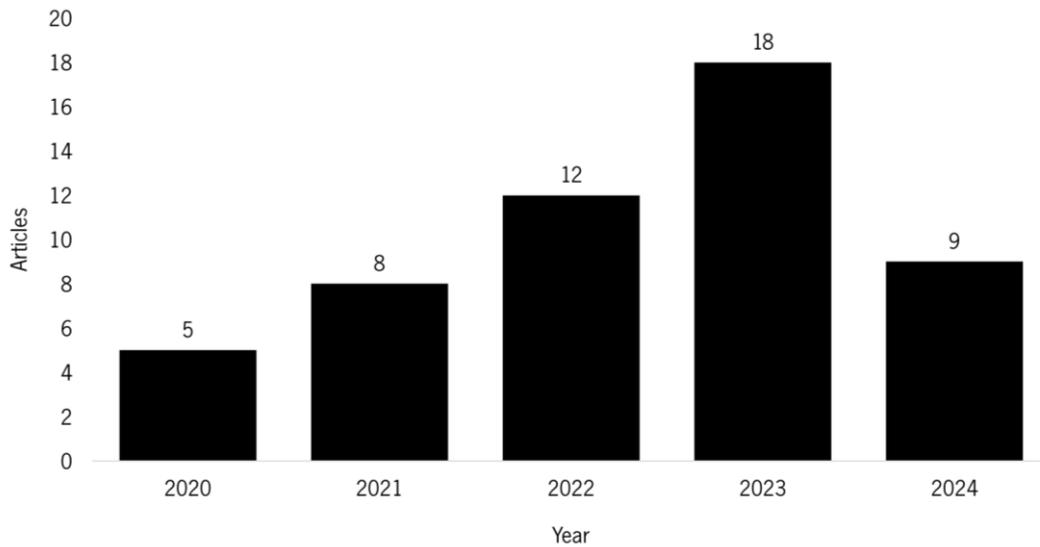
Fig. 3. Number of published articles by year in CDR literature sample

Most of the studies were published as journal articles (29), followed by conference papers (15), university publications (6) and book chapters (2). Among the most frequently cited researchers in CDR research are Carl, K.V., Doerr, S., Herden, C. J., Lobschat, L., Mueller B., and Wirtz, J., listed alphabetically. The analysis of the research methodologies reveals that the majority of the studies employed a qualitative research methodology (22), followed by conceptual papers (12). Although a few researchers adopted the mixed methods approach (10) and quantitative methods (5), case studies constituted the smallest portion of the research (3) (see Figure 4).
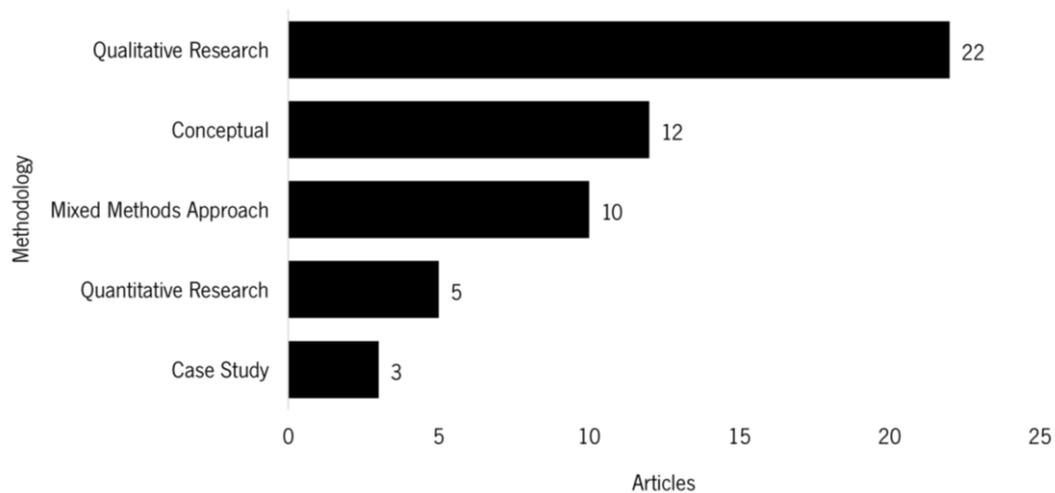

Fig. 4. Number of published articles by methodology in CDR literature sample

In the qualitative research block, many studies utilised focus group interviews and scientific questionnaires, alongside scenario techniques, content and text analysis, and hermeneutical investigations. The primary reasons for the abundance of qualitative research and scarcity of case studies are twofold: firstly, CDR encompasses a wide range of topics, including data privacy, ethical AI practices, and digital sustainability, making it challenging to execute thorough case studies. Secondly, CDR frequently demands cooperation across diverse fields like business ethics, information technology, and law. Orchestrating these cross-disciplinary endeavours can be challenging and time-intensive.

4.2. Coding process results of CDR practices

Upon reviewing and analysing the sample using the grounded theory coding process, the research field of CDR yielded 180 coded insights: 93 first-order concepts, 23 second order themes, and six aggregate dimensions (see full database in Appendix E). The coding process yields a high-level inductive map that highlights the core themes and dimensions of CDR practices, as shown in Figure 5. In the following, the most important findings of each aggregate dimension, including the second order themes, are presented and discussed (clockwise).
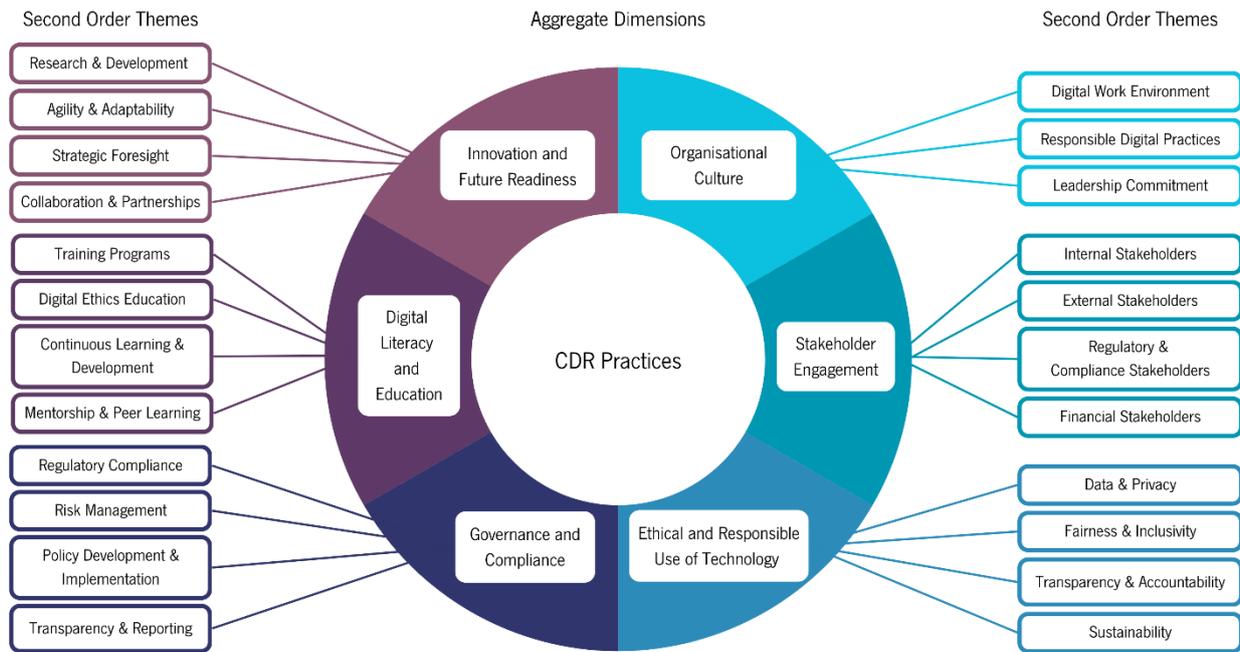

Fig. 5. CDR practices high level thematic map emerging from sample analysis

4.2.1 Organisational culture

Based on the sample analysis, it is evident that a company's organisational culture is essential for effectively implementing CDR practices in an organisational context. Developing an organisational culture that involves employees in the digital transformation process and prepares and supports them during change is crucial for the long-term success of CDR practices (Broers, 2023). In the course of the coding process, three second-order themes were identified (see Figure 6). These themes will be elaborated upon in the subsequent paragraphs.

First, a robust digital work environment fosters a culture where employees are equipped with the necessary tools and training to navigate digital landscapes responsibly. This includes ensuring data privacy, promoting digital literacy, and

creating an inclusive digital workspace that supports collaboration and innovation (Mueller, 2022). The digital work environment must also address the ergonomic and psychological well-being of employees, ensuring that digital tools enhance productivity without causing undue stress or health issues (Herden et al., 2021). Organisations must ensure that office layouts and digital workspaces demonstrate a dedication to digital responsibility. For instance, they can create collaborative spaces that encourage ethical discussions about technology use. Moreover, engaging employees in CDR initiatives through training and awareness programs fosters a sense of ownership and accountability, and transparent communication channels enable employees to voice concerns and share ideas related to CDR, promoting a culture of continuous improvement (Elliott & Copilah-Ali, 2024).
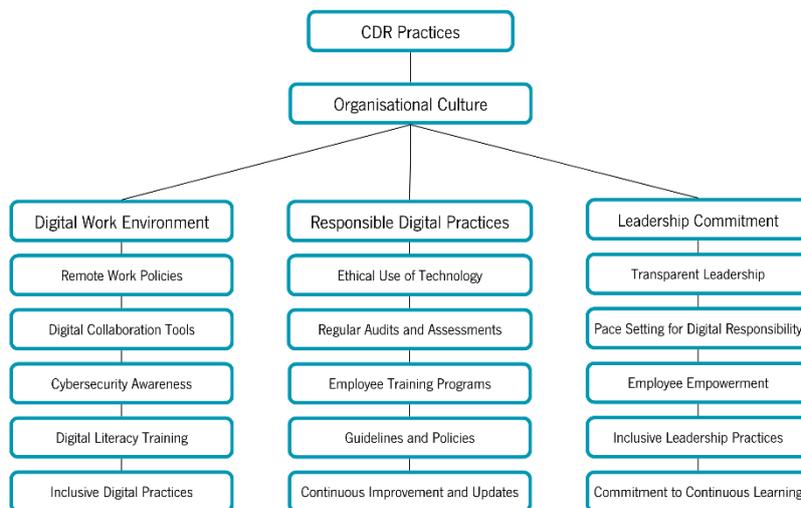

Fig. 6. Aggregate dimension of CDR practices: organisational culture

Second, responsible digital practices involve the ethical use of digital technologies, emphasizing transparency, accountability, and the minimization of digital risks such as data breaches and misinformation (Herden et al., 2021). These practices are integral to maintaining trust and integrity within the organisation and with external stakeholders, including customers and partners (Aldboush & Ferdous, 2023). Implementing responsible digital practices necessitates a comprehensive strategy that encompasses regular audits, employee training, and the establishment of clear guidelines, and policies (Lobschat et al., 2021). Moreover, organisations must stay abreast of evolving digital threats and continuously update their practices to mitigate potential risks (Broers, 2023).

Third, leadership commitment is crucial for embedding CDR into the organisational culture. Leaders play a vital role in setting the tone for CDR by demonstrating a clear commitment to a culture of digital responsibility through policies, actions, and communication (Kunz et al., 2024). This includes setting up governance frameworks, such as digital ethics boards, and advocating for responsible digital transformation. Leadership commitment also involves fostering a culture of openness and accountability, where ethical considerations are integrated into decision-making processes at all levels of the organisation (Hamadi & Manzo, 2021). By championing digital responsibility, leaders can inspire employees to adopt and uphold these values, ensuring that the organisational culture aligns with the principles of CDR (Mihale-Wilson et al., 2022).

4.2.2   Stakeholder engagement

Stakeholder engagement is the second aggregate dimension of CDR practices, emphasizing the importance of involving various stakeholder groups to ensure ethical, transparent, and sustainable digital operations. Based on the sample analysis and coding process, four key stakeholder groups can be identified: internal stakeholders, external stakeholders, regulatory and compliance stakeholders, and financial stakeholders. For each stakeholder group, the main actors or acting groups are listed, with connecting lines used to clearly associate them with the respective stakeholder group in the onion diagram in Figure 7.

Internal stakeholders, particularly employees, are crucial for carrying out and adhering to CDR guidelines within the organisation. Employees need to be well-informed and trained on digital responsibility practices to foster a culture of ethical digital behaviour within the organisation. This includes understanding data privacy, cybersecurity measures, and the ethical implications of digital technologies (Broers, 2023). Management plays a crucial role in setting the tone from the top, ensuring that digital responsibility is integrated into the company's strategic objectives and daily operations. Regular internal communications, workshops, and training sessions can help reinforce these values and practices among employees (Altmeppen & Filipović, 2019). Additionally, involving employees in the planning and implementation of CDR initiatives fosters a sense of ownership and commitment (Angermann, 2023) and creating opportunities for cross-departmental collaboration on CDR projects can lead to innovative solutions and a stronger sense of community (Aitken et al., 2021).
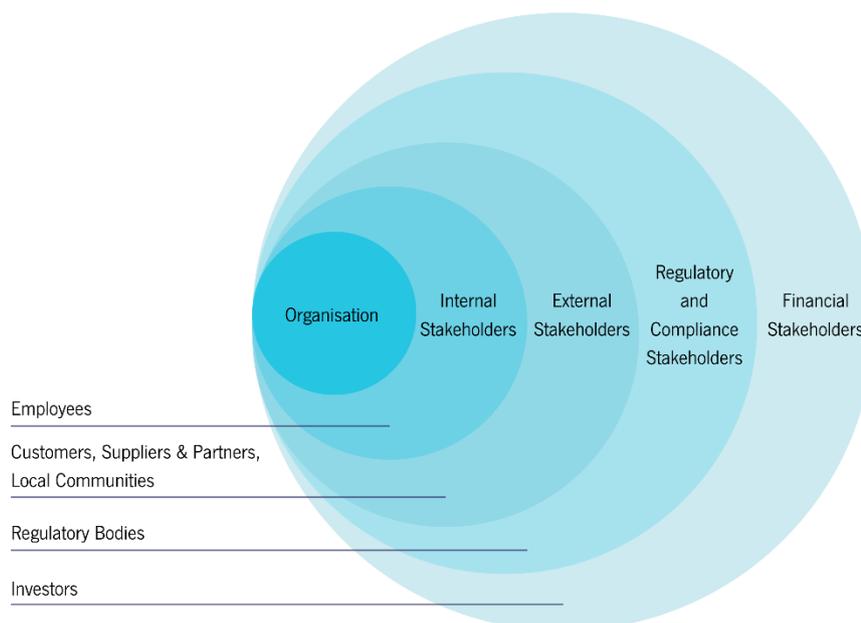

Fig. 7. Aggregate dimension of CDR practices: stakeholder engagement

External stakeholders, including customers, suppliers, partners, and local communities, play a vital role as their expectations and needs drive the ethical standards and practices of an organisation. Ensuring data privacy and security for customers, and promoting responsible digital practices among suppliers and partners, can enhance trust and reputation (Al-Omoush et al., 2024). Collaborative efforts with suppliers to uphold high standards of digital ethics and sustainability can enhance the entire supply chain's integrity (Aldboush & Ferdous, 2023). Additionally, engaging with the

broader community through CDR initiatives and digital literacy programs can further demonstrate the organisation's commitment to ethical digital practices (Schneider, 2022).

Regulatory and compliance stakeholders, such as regulatory bodies, provide the legal framework and guidelines that shape CDR strategies, ensuring organisations comply with relevant laws and ethical standards (Schneider, 2022). This proactive engagement can involve participating in industry forums, providing feedback on proposed regulations, and staying informed about changes in the regulatory landscape (Esselmann et al., 2020). Compliance with data protection laws, such as the General Data Protection Regulation (GDPR), and adherence to industry standards are essential components of CDR. By maintaining open lines of communication with regulatory bodies, companies can better navigate the complexities of digital compliance and demonstrate their commitment to legal and ethical standards (Carl, 2022). Additionally, regular internal audits and assessments help identify and address compliance gaps proactively.

Financial stakeholders, including investors, view CDR as a component of the organisation's broader sustainability and governance commitments, influencing their confidence and investment decisions (Marengo, 2023). For instance, transparent reporting on digital responsibility initiatives, such as sustainability reports and disclosures on data privacy practices, can enhance investor confidence (Kivistoe, 2024). Organisations that prioritize digital responsibility are often seen as lower-risk investments, as they are better prepared to handle regulatory changes and potential digital crises (Mueller, 2022). Engaging with financial stakeholders through regular updates, investor meetings, and sustainability reports can help align their interests with the organisation's long-term CDR practices and goals.

4.2.3   Ethical and responsible use of technology

The ethical and responsible use of technology is the third aggregate dimension of CDR practices, encompassing four secondary themes: data and privacy (DP), fairness and inclusivity (FI), sustainability (S), and transparency and accountability (TA) (see Figure 8).
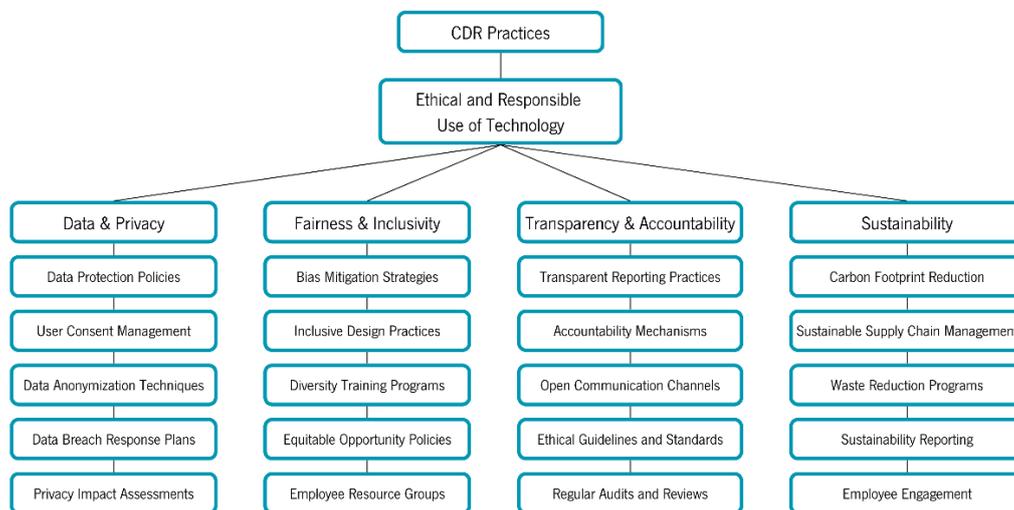
Fig. 8. Aggregate dimension of CDR practices: ethical and responsible use of technology

Data and privacy (DP) focuses on safeguarding personal information and ensuring that data collection, storage, and processing are conducted transparently and securely, respecting individuals' rights and comply with legal standards (Cheng & Zhang, 2023). This involves adopting practices such as data minimization and encryption, as well as implementing robust data protection measures and adhering to regulations such as the General Data Protection Regulation

(GDPR) to prevent data breaches and misuse (Kaerpaenen, 2022). According to Van Der Merwe and Al Achkar (2022), the integration of data responsibility within CDR frameworks is essential for managing the ethical implications of data-driven technologies.

Fairness and inclusivity (FI) aim to eliminate biases in technology deployment and promote equal access and opportunities for all users. This second order theme ensures that digital advancements benefit diverse populations without discrimination (Wagener, 2022). This involves actively working to eliminate algorithmic biases, ensuring accessibility for people with disabilities, and fostering a diverse and inclusive digital environment that reflects the varied needs and perspectives of society (Altmeppen & Filipović, 2019). Doerr and Lautermann (2024) highlight the importance of creating a fair and inclusive digital society that goes beyond the legal minimum to address the needs of all stakeholders.

Sustainability (S) integrates environmental considerations into digital practices, emphasizing the reduction of carbon footprints, responsible resource use, and the development of eco-friendly technologies to support long-term ecological balance (Nagano, 2023). This involves adopting energy-efficient data centres, promoting the use of renewable energy sources, and designing products with a focus on recyclability and minimal environmental impact. By aligning technological advancements with ecological responsibilities, companies can contribute to a more sustainable future while also enhancing their reputation and competitiveness (Napoli, 2023). Herden et al. (2021) discuss the emerging responsibilities of organisations in relation to their digitalisation-related impacts, emphasizing the need for sustainable digital practices.

Transparency and accountability (TA) are critical for organisations to maintain public trust and demonstrate corporate integrity. It involves clear communication about how technologies are used and governed, ensuring that organisations are answerable for their digital actions and decisions (Wirtz et al., 2023). This includes providing users with understandable privacy policies, obtaining informed consent, and being responsive to user inquiries and concerns (Carl & Hinz, 2024). Additionally, organisations should establish mechanisms for accountability, such as independent audits and transparent reporting, to ensure that they are held responsible for their digital actions (Schneider, 2022).

Overall, these four second order themes are interconnected; they overlap, reinforce one another, and collectively establish an approach that ensures technology serves society in a responsible and ethical manner within the framework of CDR practices. Figure 9 demonstrates the interconnections and mutual influences among these themes.

- DPFI = Inclusive Data Ethics
- FIS = Equitable and Sustainable Development
- STA = Accountable Green Practices
- DPTA = Clear and Ethical Data Governance
- DPFITA = Ethical and Inclusive Data Transparency
- DPFIS = Sustainable and Equitable Data Practices
- FISTA = Transparent and Inclusive Sustainability Practices
- DPSTA = Sustainable and Transparent Data Management
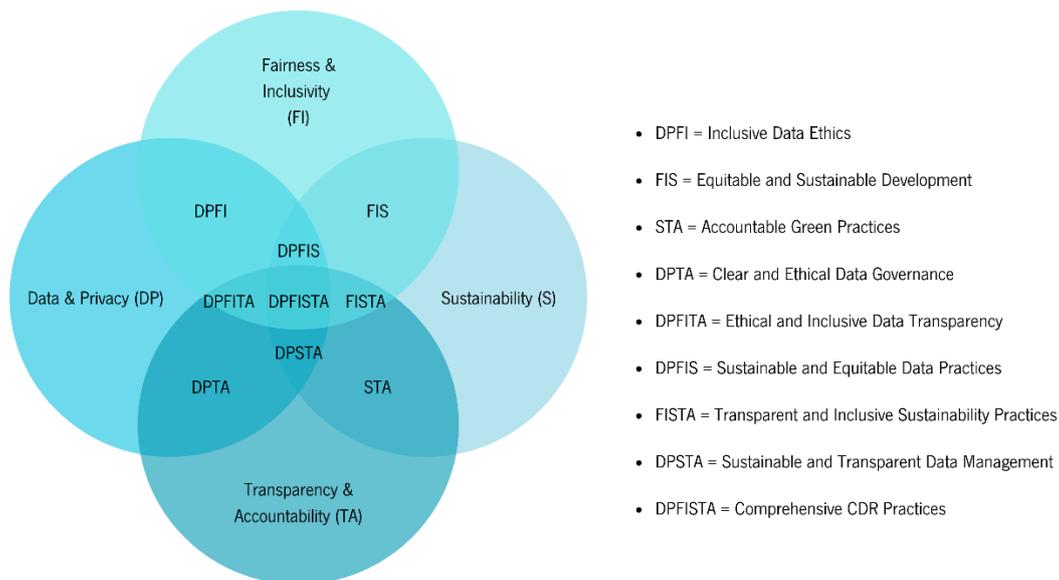- DPFISTA = Comprehensive CDR Practices

Fig. 9. Ethical and responsible use of technology - interconnection of second order themes

For instance, ethical data practices must be transparent and inclusive to build trust and ensure fairness. When organisations are transparent about their data practices and hold themselves accountable, they foster a culture of trust and responsibility, which is essential for maintaining user confidence and compliance with regulations. Similarly, sustainable practices should be accountable and inclusive, ensuring that environmental benefits are equitably distributed and do not disproportionately impact any group.

4.2.4   Governance and compliance

Governance and compliance is the fourth aggregate dimension of CDR practices, that ensures organisations adhere to ethical standards and legal requirements while leveraging digital technologies (Elliott & Copilah-Ali, 2024). Analysis of the sample data indicates the necessity for digital activities to align with legal, ethical, and societal expectations (Angermann, 2023; Broers, 2023; Lobschat et al., 2021). This results in the identification of four second order themes: regulatory compliance, risk management, policy development, and transparency and reporting (see Figure 10).
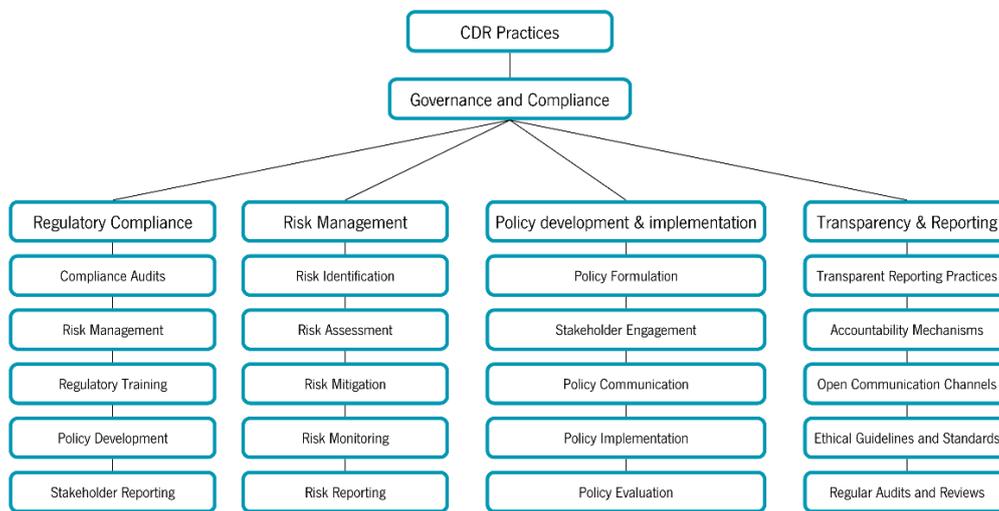

Fig. 10. Aggregate dimension of CDR practices: governance and compliance

Risk management in a CDR context focuses on identifying, assessing, and mitigating risks associated with digital operations (Weber-Lewerenz, 2022). This includes cybersecurity threats, data breaches, and other digital vulnerabilities that could impact the organisation. A proactive risk management approach involves conducting thorough risk assessments, developing and implementing risk mitigation strategies, and continuously monitoring risk exposure (Aldboush & Ferdous, 2023). By developing a comprehensive risk management strategy, organisations can effectively respond to digital threats, reducing potential damage and preserving operational integrity (Carl, 2022).

For effective implementation of CDR practices within an organisation, it is essential to have clear policies and procedures (Angermann, 2023). Policy development involves creating, updating, and implementing policies that govern digital practices within the organisation. These policies should be comprehensive, covering all aspects of digital responsibility, such as data protection, cybersecurity, ethical use of technology, and employee conduct (Wagener, 2022; Lobschat et al., 2021). Additionally, policies should be regularly reviewed and updated to reflect changes in technology, regulations, and organizational priorities (Mihale-Wilson et al., 2022).

Regulatory compliance involves adhering to digital laws and regulations, including data protection statutes such as the General Data Protection Regulation (GDPR) in Europe and the California Consumer Privacy Act (CCPA) in the United States, cybersecurity standards, and industry-specific mandates (Schneider, 2022). It also includes implementing Information Security Management Systems (ISMS) like ISO 27001 to manage risks and protect sensitive data (Mueller, 2022). Additionally, organisations need to establish compliance programmes to monitor and enforce these regulations, ensuring all digital practices comply with legal requirements (Carl & Hinz, 2024). This process involves conducting regular compliance audits, staying informed about regulatory updates, and providing training to employees on compliance-related topics (Wirtz et al., 2023).

Transparency and reporting emphasize the importance of clear and honest communication about digital practices. This includes regular reporting to stakeholders on compliance activities, risk management efforts, and policy adherence (Elliott et al., 2021). This transparency builds trust and accountability, fostering a culture of responsibility and ethical behaviour (Aitken et al., 2021). Transparency also includes interacting with stakeholders to understand their concerns and expectations, establishing open communication channels for feedback and inquiries, and integrating their feedback into digital responsibility practices (Jones, 2023).

4.2.5   Digital literacy and education

Digital literacy and education are fundamental components of CDR practices, designed to equip employees with essential digital skills and ethical awareness necessary for success in a technology-driven environment (Lautermann & Frick, 2023). The sample analysis indicates that cultivating a digitally proficient and ethically conscious workforce involves employing diverse formats and methodologies (Breivogel, 2024). These formats and methodologies are conceptualised in four second order themes: training programs, digital ethics education, mentorship and peer learning, and continuous learning and development (see Figure 11).
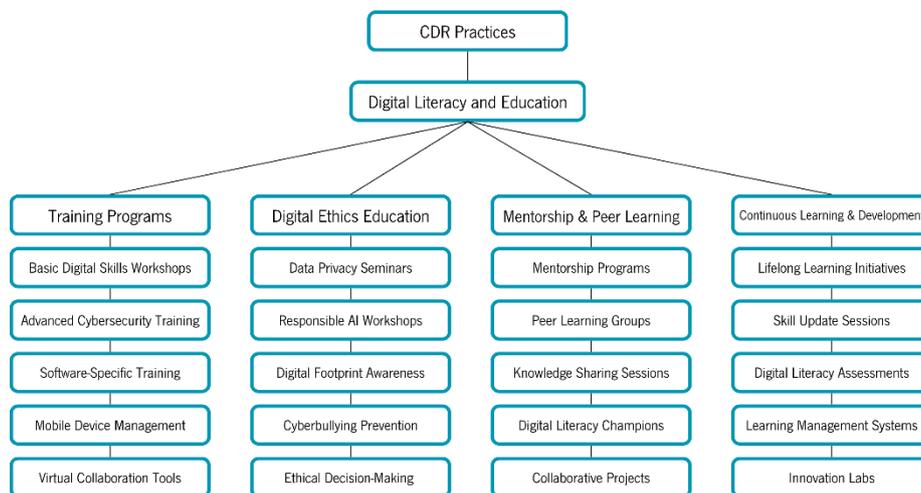
Fig. 11. Aggregate dimension of CDR practices: digital literacy and education

First, training programs are an essential part of digital literacy initiatives, offering structured opportunities for individuals to develop essential digital skills. These programs often encompass a wide range of topics, from basic digital tool usage to advanced cybersecurity measures (Clausen et al., 2023). According to Lautermann and Frick (2023), digital literacy training programs are instrumental in bridging the digital divide and fostering an inclusive digital ecosystem. These

programs are crucial for developing competencies such as information-seeking and communication, which are vital for personal and professional growth in the digital age.

Second, digital ethics education is another critical subdimension, focusing on the ethical implications of digital technology use. It involves informing employees about ethical issues related to digital technology, such as data privacy, cybersecurity, and the responsible use of digital tools (Elliott & Copilah-Ali, 2024). This education serves as a counterpart to the aggregate dimension of ethical and responsible use of technology. It can be provided through courses, seminars, and discussion groups. Real-world case studies and role-playing scenarios can assist employees in understanding and addressing ethical dilemmas they may face in their work.

Third, mentorship and peer learning play a crucial role in fostering a collaborative learning environment. Through mentorship programs, experienced individuals guide less experienced colleagues, sharing knowledge and best practices. Peer learning initiatives further enhance this by promoting knowledge exchange and collaborative problem-solving among employees (Lautermann & Frick, 2023). Additionally, peer learning groups promote knowledge sharing and collaboration among employees, fostering a culture of continuous improvement and ethical awareness (Clausen et al., 2023).

Last, continuous learning and development emphasizes the need for ongoing education to keep pace with rapid technological advancements (Mueller, 2022). This subdimension includes regular reassessments to evaluate progress and identify new learning requirements. This approach encourages a culture of lifelong learning, where employees are motivated to continually update their skills and knowledge (Wagener, 2022).

4.2.6   Innovation and future readiness

The final aggregate dimension for CDR practices is innovation and future readiness, which are crucial for organisations aiming to maintain a competitive edge and to be prepared to navigate and thrive in an ever-evolving digital landscape. This dimension encompasses four second-order themes that constitute a robust framework for innovation and future readiness in CDR: research and development (R&D), agility and adaptability, strategic foresight, and collaboration and partnerships. By incorporating these elements into their strategies, organisations can ensure they are not only prepared for future challenges but are also proactively shaping the future in a responsible and sustainable manner (see Figure 12).
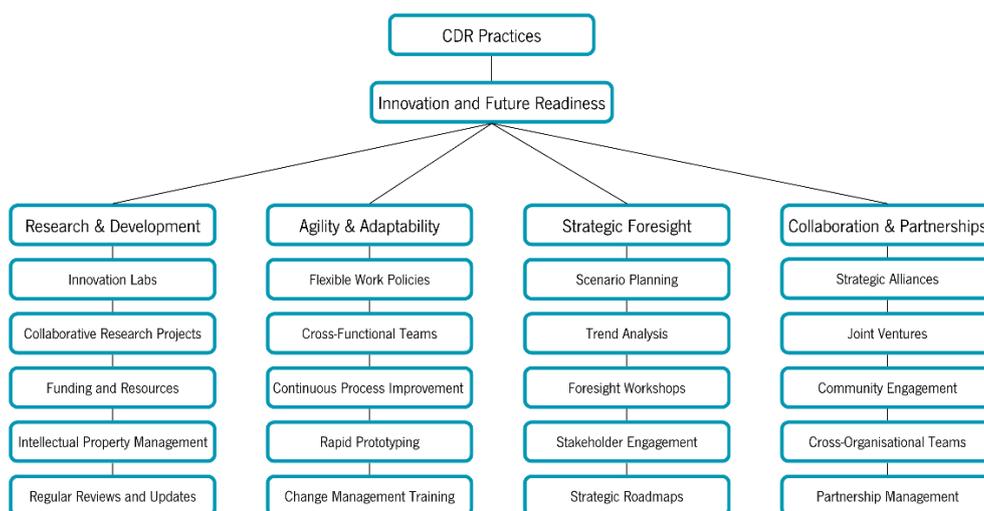

Fig. 12. Aggregate dimension of CDR practices: innovation and future readiness

Current research emphasizes that R&D is an important mechanism to drive the creation of new technologies and solutions that align with CDR practices (Kluiters et al., 2023). By investing in R&D, organisations can develop cutting-edge products and services that meet ethical standards and address societal needs, which in return fosters the successful implementation of CDR practices (Mihale-Wilson et al., 2022). In other words, prioritizing projects that have positive societal impacts, such as developing sustainable technologies or enhancing data privacy and security. By focusing on responsible R&D, organisations can ensure that their innovations do not harm society or the environment and align with broader ethical standards (Elliott et al., 2021).

In a rapidly evolving digital landscape, agility and adaptability are crucial for maintaining relevance and competitiveness. In terms of CDR, this means being able to quickly adapt to new regulations, ethical standards, and societal expectations (Breivogel, 2024). Current research highlights that organisations that are agile can more effectively implement responsible digital practices, such as swiftly addressing data breaches or adapting to new privacy laws (Viitikko, 2022).

Strategic foresight involves anticipating future trends and disruptions, enabling organisations to proactively shape their digital strategies and mitigate potential risks. This phase includes trend analysis and scenario planning, helping organisations prepare for potential future developments (Angermann, 2023). Moreover, current research emphasizes the role of strategic foresight in fostering corporate digital innovation, particularly in the context of environmental, social, and governance (ESG) practices (Herden et al., 2021).

Finally, collaboration and partnerships emphasize the importance of working with various stakeholders, including nonprofits, academia, and other businesses, to foster innovation and share best practices. These partnerships can enhance an organisation's ability to address complex digital challenges and drive collective progress towards responsible digital transformation (Elliott & Copilah-Ali, 2024). The integration of digital technologies in CSR activities has been shown to benefit from such collaborations, leading to more effective and impactful outcomes (Kunz et al., 2024; Lautermann & Frick, 2023).

5. Discussion

5.1. Synthesis and discussion of findings

Returning to the three research questions, RQ1 required a thorough examination of previous research on CDR through the analysis of literature reviews, organised into pre-adoption, adoption, and post-adoption phases, to identify potential research gaps. This structured approach highlighted the importance of a holistic CDR strategy and identified a significant research gap in the post-adoption phase, emphasizing long-term sustainability. RQ2 involved conducting a SLR of 52 studies from 2020 to 2024, defining six dimensions of CDR practices: organisational culture, stakeholder engagement, ethical and responsible use of technology, governance and compliance, digital literacy and education, and innovation and future readiness. These dimensions were derived from a detailed coding process that yielded 180 insights. Finally, RQ3 involves developing a research agenda that proposes new directions for future CDR research based on the synthesised findings and identified gaps. In order to develop the research agenda (RQ3), it is necessary to conduct a comparative discussion of the findings from previous research on CDR (RQ1) and current studies and research papers on CDR practices (RQ2) to achieve a synthesized overview.

To systematically compare the literature on each aggregate dimension, a comprehensive framework was developed to evaluate the presence (P), frequency (F), and relevance (R) of second order themes within both previous research on CDR (28 in total) and current research papers on CDR practices (52 in total).

Within this comprehensive framework, the following literature coding schema, extended based on research from Lacity et al. (2017) and Könning et al. (2019), was applied:

- **Presence (P)**: 1 if second order theme is mentioned, 0 if not.
- **Frequency (F)**: +1 if second order theme is frequently mentioned, 0 if occasionally, -1 if rarely.
- **Relevance (R)**: +1 if second order theme is central, 0 if mentioned, -1 if peripheral.

A detailed overview of the coding results across all second order themes can be found in Table 2.

Table 2. Coding schema results

Aggregate dimensions	Second order themes	Previous CDR Research (RQ1)								SLR CDR Practices (RQ2)							
		P		F			R			P		F			R		
		1	0	+1	0	-1	+1	0	-1	1	0	+1	0	-1	+1	0	-1
Organisational culture	1 Digital work environment	5	23	1	1	3	0	3	2	7	45	3	2	2	1	5	1
	2 Responsible digital practices	21	7	8	8	5	4	12	5	34	18	15	12	7	9	18	7
	3 Leadership commitment	4	24	2	1	1	1	2	1	10	42	6	3	1	1	4	1
Stakeholder engagement	4 Internal stakeholders	2	26	1	1	0	0	0	2	8	44	3	3	2	1	4	3
	5 External stakeholders	2	26	1	1	0	0	0	2	8	44	3	3	2	1	4	3
	6 Regulatory & compliance stakeholders	1	27	0	1	0	0	1	0	6	46	2	2	2	1	3	2
	7 Financial stakeholders	0	28	0	0	0	0	0	0	3	49	1	1	1	0	2	1
Ethical and responsible use of technology	8 Data & privacy	2	26	0	1	1	0	0	2	7	45	1	4	2	0	2	5
	9 Fairness & inclusivity	1	27	0	1	0	0	0	1	2	50	0	1	1	0	1	1
	10 Transparency & accountability	2	26	1	1	0	0	1	1	4	48	2	1	1	1	2	1
	11 Sustainability	5	23	2	2	1	1	2	2	12	40	4	5	3	3	5	4
Governance and compliance	12 Regulatory compliance	4	24	1	1	2	0	1	3	14	38	4	3	7	3	4	7
	13 Risk Management	2	26	0	0	2	0	0	2	3	49	0	1	2	0	1	2
	14 Policy development & implementation	1	27	0	0	1	0	0	1	3	49	0	1	2	0	1	2
	15 Transparency & reporting	2	26	0	1	1	0	1	1	5	47	1	2	2	0	2	3

Aggregate dimensions	Second order themes	Previous CDR Research (RQ1)								SLR CDR Practices (RQ2)							
		P		F			R			P		F			R		
		1	0	+1	0	-1	+1	0	-1	1	0	+1	0	-1	+1	0	-1
Digital literacy and education	16 Training programs	1	27	0	0	1	0	0	1	4	48	0	2	2	0	2	2
	17 Digital ethics education	0	28	0	0	0	0	0	0	5	47	0	2	3	0	2	3
	18 Continuous learning & development	1	27	0	0	1	0	0	1	2	50	0	1	1	0	1	1
	19 Mentorship & peer learning	0	28	0	0	0	0	0	0	3	49	0	1	2	0	1	2
Innovation and future readiness	20 Research & development	1	27	0	0	1	0	0	1	3	49	0	1	2	0	1	2
	21 Agility & adaptability	2	26	0	1	1	0	1	1	6	46	1	3	2	1	3	2
	22 Strategic foresight	1	27	0	0	1	0	0	1	4	48	1	2	1	1	2	1
	23 Collaboration & partnerships	0	28	0	0	0	0	0	0	2	50	0	1	1	0	1	1

Figure 13 illustrates the percentage distribution of second order themes across previous research on CDR through the analysis of literature reviews and the SLR results on CDR practices from Table 2. The first three themes, related to organisational culture, show consistent distribution. However, literature on stakeholder engagement varies significantly. Regulatory compliance is mentioned in 14.3% of CDR literature reviews, but appears in 26.9% of research papers on CDR practices. Digital ethics education (item 17) is absent in literature reviews but appears in at least five research papers. Agility and adaptability (item 21) are more frequently discussed in literature reviews than in research papers.

Both previous research on CDR through the analysis of literature reviews and the SLR results on CDR practices underscore the necessity of an in-depth approach that integrates social, economic, technological, and environmental aspects. This integration ensures that CDR practices are aligned with an organisation's strategic objectives and ethical standards. Both sources highlight the importance of fostering an organisational culture that encourages digital responsibility, while also providing a conducive digital work environment for employees. For instance, contemporary literature reviews on CDR primarily discuss the need for employee engagement in promoting ethical and responsible digital practices (e.g., Wirtz et al., 2023). Similarly, research papers on CDR identify organisational culture as a pivotal factor, emphasizing the role of leadership commitment in establishing the foundation for CDR and involving employees in the digital transformation process. For example, Lobschat et al. (2021) emphasize the significance of a supportive organisational culture in advancing CDR initiatives.

While previous research on CDR through the analysis of literature reviews generally address the relevance of organisational culture for CDR, research papers on CDR practices conceptualise the specific subdimensions of organisational culture that need to be involved and how they interact. Additionally, some research papers offer concrete actions such as minimizing digital risks, building an inclusive digital workspace, and establishing digital ethics boards and governance frameworks. However, further research is necessary to analyse the relationship between CDR and organisational culture, including correlating effects, dimensions, and clear, adjustable action plans for organisations. A summary of pertinent future research questions is provided in Table 3, located in the subsequent chapter, as part of the developed research agenda.

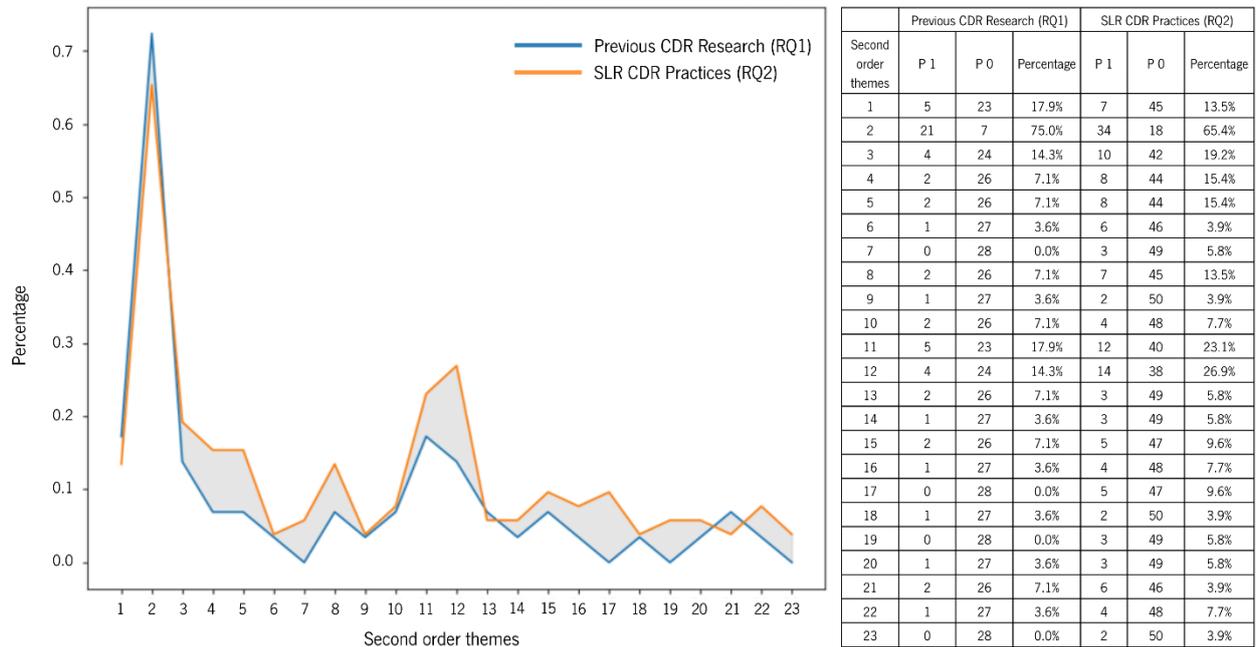| Second order themes	Previous CDR Research (RQ1)			SLR CDR Practices (RQ2)		
	P 1	P 0	Percentage	P 1	P 0	Percentage
1	5	23	17.9%	7	45	13.5%
2	21	7	75.0%	34	18	65.4%
3	4	24	14.3%	10	42	19.2%
4	2	26	7.1%	8	44	15.4%
5	2	26	7.1%	8	44	15.4%
6	1	27	3.6%	6	46	3.9%
7	0	28	0.0%	3	49	5.8%
8	2	26	7.1%	7	45	13.5%
9	1	27	3.6%	2	50	3.9%
10	2	26	7.1%	4	48	7.7%
11	5	23	17.9%	12	40	23.1%
12	4	24	14.3%	14	38	26.9%
13	2	26	7.1%	3	49	5.8%
14	1	27	3.6%	3	49	5.8%
15	2	26	7.1%	5	47	9.6%
16	1	27	3.6%	4	48	7.7%
17	0	28	0.0%	5	47	9.6%
18	1	27	3.6%	2	50	3.9%
19	0	28	0.0%	3	49	5.8%
20	1	27	3.6%	3	49	5.8%
21	2	26	7.1%	6	46	3.9%
22	1	27	3.6%	4	48	7.7%
23	0	28	0.0%	2	50	3.9%

Fig. 13. Distribution of second order themes across previous CDR research and SLR results on CDR practices in percentage

Engaging stakeholders is a common theme in both previous CDR literature reviews and research papers on CDR practices. Altmeppen and Filipović (2019) identify ethical considerations, regulatory compliance, reputation management, corporate governance, and competitive advantage as key motivators for stakeholders to adopt CDR strategies. Research papers also emphasize stakeholder engagement, illustrating how organisations collaborate with customers, suppliers, regulatory bodies, and investors to maintain ethical digital practices. Broers (2023) highlights the role of stakeholder engagement in promoting transparency and accountability within CDR practices. Table 2 shows that literature reviews focus on internal and external stakeholders, while research papers additionally highlight regulatory, compliance, and financial stakeholders. Engaging financial stakeholders through updates, meetings, and sustainability reports helps align their interests with long-term CDR objectives. Further research is needed to explore the relationship between behavioural finance, investor management, and CDR implementation.

Both samples highlight the importance of ethical and responsible use of technology, including data privacy, fairness, inclusivity, transparency, and sustainability (Mueller, 2022; Broers, 2023; Mihale-Wilson et al., 2022). As shown in Table 2, most research in both samples focuses on sustainability. Literature reviews primarily discuss the ethical implications of digital technology use and the significance of data protection measures (Wynn & Jones, 2023; Cheng & Zhang, 2023). Research papers on CDR practices elaborate on these themes, providing detailed insights into how organizations can implement responsible digital practices and address issues such as algorithmic biases and cybersecurity threats. For example, Carl (2021) and Volkov and Sidorenko (2022) emphasize the need for robust data protection measures. Although current literature has identified dimensions of ethical and responsible use of technology, research on their intersections and interrelationships remains limited. Chapter 4 introduces Figure 8, which provides an initial illustration to understand the interdependencies among these second-order themes. Further research is necessary to explore each theme and its subdimensions in greater depth. This will improve our understanding of defining and measuring accountable green practices, ethical and inclusive data transparency, sustainable and transparent data management, and other related concepts.

Governance and compliance are foundational to CDR practices in both samples. Previous research on CDR through the analysis of literature reviews outline the need for robust governance frameworks and compliance with digital laws and regulations. For instance, Jelovac et al. (2022) discuss the importance of governance frameworks for maintaining responsible digital conduct. The research papers on CDR practices build on this by identifying governance and compliance as a key dimension, emphasizing the importance of risk management, policy development, regulatory compliance and transparency and reporting (Broers, 2023; Sidaoui et al., 2024). While literature in both samples underscore the significance of governance frameworks and compliance, there is a lack of detailed guidance on the development and implementation of specific policies that address data governance, cybersecurity, and ethical AI usage. It is essential to ensure that digital practices are in alignment with organisational values and societal expectations. Further research is required to address topics such as establishing clear organisational communication regarding digital practices, adhering consistently to laws and regulations governing data protection, privacy, and digital transactions, and mitigating risks associated with digital operations.

For digital literacy and education, previous research on CDR through the analysis of literature reviews primarily focuses on CDR awareness and understanding, emphasizing the role of organisations in promoting these practices (Lobschat et al., 2021; Mueller, 2022). Research papers on CDR practices emphasize the importance of employee training and educational initiatives for effective CDR implementation, with digital literacy being a critical component. For example, Aldboush and Ferdous (2023) examine how digital literacy fosters ethical digital behaviour among employees, while Lautermann and Frick (2023) underscore the role of companies in advancing digital literacy, disseminating knowledge, and shaping digital policies responsibly. As illustrated in Table 2, only two literature reviews comprehensively address training programs and continuous learning for CDR. Moreover, no research paper has centrally focused on analysing the effects of digital ethics education and training programs on the long-term success of CDR practices. Therefore, further research should elaborate on specific training programs, workshop formats, and continuous learning principles for internal and external stakeholders.

Finally, for the aggregate dimension of innovation and future readiness, previous research on CDR through the analysis of literature reviews primarily focuses on the necessity of staying abreast of technological advancements and being prepared for forthcoming challenges (Lobschat et al., 2021; Wirtz et al., 2023). Nevertheless, none of the four second order themes were frequently mentioned in the reviews, nor were they central to the research itself. In contrast, research papers on CDR practices emphasize the significance of continuous improvement and proactive strategies in ensuring that organisations are able to build a strategic foresight about upcoming digital challenges (Broers, 2023; Elliott & Copilah-Ali, 2024). Current literature reviews indicate that research regarding specific mechanisms and actions for preparing for future CDR challenges is limited, largely due to the scarcity of long-term study data. Building on this foundation, Chapter 4 outlines preliminary actions for organisations, highlighting the importance of partnerships, R&D investments, agility, and strategic foresight. Future research could explore how to translate these insights into a flow diagram and process, making them more accessible for organisations of varying sizes, industries, and scopes. Additionally, given that this lies beyond the scope of the current paper, future research should examine the long-term impact of R&D investments in CDR, as well as the advantages of partner collaboration and stakeholder engagement.

5.2. Continued research agenda

Based on the synthesised findings from both sections, a research agenda for RQ3 has been developed that suggests new directions for future CDR research. This involved merging the discussion topics from Table 1 in Section 2 with the related aggregate dimension from Section 4, where applicable. This process provides a comprehensive overview of all potential research questions identified in this study, as illustrated and summarised in Table 3.

Table 3. Potential future research questions in CDR research

Aggregate dimensions	Second order themes	Related discussion topics (if applicable)	Indicative potential research questions
Organisational culture	• Digital work environment • Responsible digital practices • Leadership commitment	• CDR readiness and organisational mindset	• What are the correlating effects between CDR and various dimensions of organisational culture? • How can organisations develop clear and adjustable action plans to integrate CDR into their existing organisational culture?
Stakeholder engagement	• Internal stakeholders • External stakeholders • Regulatory & compliance stakeholders • Financial stakeholders	• Motivating factors • CDR implementation strategies	• How do CDR initiatives affect different stakeholder groups, including employees, consumers, and society? • How does behavioural finance influence investor management practices in the context of CDR implementation strategies? • What are the key factors in investor management that affect the successful implementation of CDR strategies within organisations?
Ethical and responsible use of technology	• Data & privacy • Fairness & inclusivity • Transparency & accountability • Sustainability	• Data and AI • Data privacy and security • Sustainability and environmental impact	• How can accountable green practices be defined and measured within the framework of sustainable and transparent data management? • What are the subdimensions of ethical and inclusive data transparency, and how can they be effectively implemented and assessed in organisational contexts? • How do various regulatory frameworks impact the use of data and AI within the context of CDR?
Governance and compliance	• Regulatory compliance • Risk Management • Policy development & implementation • Transparency & reporting	• Governance and frameworks • Digital governance and accountability • Risk assessment and management • CDR dimensions • Monitoring and evaluation • Reporting and communication	• How can organisations establish clear and effective communication strategies regarding digital practices to ensure transparency and compliance? • What are the best practices for consistently adhering to laws and regulations governing data protection, privacy, and digital transactions while mitigating risks associated with digital operations? • What accountability mechanisms can be developed to ensure responsible digital governance in the context of CDR?
Digital literacy and education	• Training programs • Digital ethics education • Continuous learning & development • Mentorship & peer learning	• CDR awareness and understanding	• What are the most effective training programs and workshop formats for enhancing digital skills among internal and external stakeholders? • How can continuous learning principles be integrated into organisational training to support the evolving needs of a digital workforce? • What structured and iterative approaches can organisations adopt to create a dynamic and adaptive training environment for digital transformation?

Aggregate dimensions	Second order themes	Related discussion topics (if applicable)	Indicative potential research questions
Innovation and future readiness	• R&D • Agility & adaptability • Strategic foresight • Collaboration & partnerships	• Impacts and benefits	• How can insights from CDR be translated into a flow diagram and process to enhance accessibility for organisations of varying sizes, industries, and scopes? • What are the long-term impacts of R&D investments in CDR, and how do partner collaboration and stakeholder engagement contribute to these outcomes? • How can organizations develop frameworks for responsible innovation that balance the need for progress with ethical considerations?

Strong organisational culture and leadership commitment are vital for successful CDR practice implementation. Promoting a culture that supports digital transformation and ethical practices requires effort at all levels. Current research lacks sufficient focus on overcoming resistance to change from employees or management. Future studies should explore strategies to address this and foster continuous improvement and ethical awareness. Additionally, research should examine how organisations can create flexible action plans to integrate CDR into their culture and explore the relationship between CDR and various aspects of organisational culture.

Future research should delve into the power dynamics and conflicts of interest among CDR stakeholders, such as financial entities, regulatory bodies, and the community. Managing these conflicts is crucial for implementing CDR effectively. Additionally, investigating how cultural and regional differences influence CDR adoption and identifying best practices for stakeholder engagement are important research areas.

To ensure the ethical and responsible use of technology, future studies need to investigate the practical challenges that organisations may encounter in implementing principles such as fairness, inclusivity, transparency, and accountability. For instance, maintaining data privacy and security amidst increasing cyber threats is a notable challenge. Additionally, achieving fairness and inclusivity in AI and algorithmic decision-making requires ongoing monitoring and adjustments to mitigate biases. Future research should aim to develop practical tools and frameworks to assist organisations in addressing these challenges. Furthermore, it is crucial to examine how models for data privacy and security can adapt to the rapidly evolving nature of CDR and to identify metrics that effectively measure the environmental impact of digital practices within CDR.

Governance and compliance are key components of CDR practices, which include regulatory compliance, risk management, policy development, and transparency and reporting. The study offers a foundation for understanding these aspects but could further explore the complexities of regulatory compliance in different jurisdictions. Due to the global nature of digital business, organisations often operate across various regulatory environments, each with its own rules and standards. Navigating these complexities requires an understanding of international regulations and the ability to adapt governance frameworks accordingly. Additionally, future research should examine metrics for measuring the impact of CDR initiatives and mechanisms for ensuring transparency and accountability in CDR reporting.

Equipping employees with digital skills and ethical awareness is important for fostering a responsible digital culture, as summarised in the dimension of digital literacy and education. Future studies could examine the barriers to effective digital education, such as varying levels of digital proficiency among employees and the rapid pace of technological change. Additionally, the effectiveness of different training methods and their impact on employee behaviour and organisational culture could be investigated further. Another area of interest is CDR awareness, where future research could analyse how organisations can benchmark their CDR awareness level against industry standards.

Finally, the dimension of innovation and future readiness encourages investment in research and development, agility and adaptability, strategic foresight, and collaboration and partnerships. While these are vital for staying ahead in the digital frontier, the study could address the potential risks associated with rapid innovation. For instance, the rush to adopt new technologies without fully understanding their ethical implications can lead to unintended consequences. Future research should focus on developing frameworks for responsible innovation that balance the need for progress with ethical considerations.

6. Conclusion

This paper contributes valuable insights for both researchers and practitioners, guiding the development of more effective CDR practices and policies. We conducted the first exhaustive SLR on defining dimensions of CDR practices using grounded theory. We identified major and emerging research streams in previous research on CDR through the analysis of literature reviews (RQ1), categorised by adoption phase and discussion topic, showing the field's current state and identified potential research gaps. We further defined and conceptualized the aggregate dimensions of CDR practices to provide a first foundational framework that can drive strategic CDR initiatives (RQ2). Finally, we established a research agenda (RQ3) for the CDR research field to offer additional directions for future research.

The findings from this research paper have significant implications for organisations aiming to implement CDR practices, as well as for researchers and practitioners seeking to understand the scope of CDR practices. The identification of six aggregate dimensions of CDR practices offers a structured framework for organisations to assess and improve their CDR initiatives. By incorporating these dimensions into their strategic planning, organisations can adopt a comprehensive approach to digital responsibility that aligns with their core values and operational objectives.

For researchers, the comprehensive framework of CDR practices offers a solid foundation for empirical studies, enabling hypothesis development and testing across industries and cultures. It emphasizes interdisciplinary research combining business ethics, information systems, and corporate governance to create robust CDR models. Identifying literature gaps, such as the need for long-term impact studies, guides future research.

For practitioners, the comprehensive framework of CDR practices serves as a diagnostic tool to assess and improve CDR practices. It helps develop targeted strategies for enhancing stakeholder engagement and data privacy. Emphasizing continuous education and digital literacy, it highlights the importance of employee training programs. Transparent communication and collaboration with stakeholders are crucial for fostering trust and accountability in CDR initiatives.

There are several limitations to this research paper. First, the subjective nature of qualitative evaluations introduces a potential for bias, which could influence the interpretation of the research findings. Second, given the dynamic and rapidly evolving nature of the digital landscape, the reviewed CDR literature may soon become outdated and obsolete as new technologies and practises emerge. Third, the scope of the research sample studies, even though extensive, may still miss critical studies published in less prominent journals or emerging domains that are not yet widely recognized. However, despite these limitations, it is hoped that the research paper instigates and guides future CDR research.

In conclusion, this research underscores the critical importance of CDR in navigating the complexities of the digital frontier. By identifying and defining the six aggregate dimensions of CDR practices, this study provides a foundational framework for both researchers and practitioners to evaluate and enhance CDR initiatives. As digital transformation continues to evolve, it is imperative for organisations to adopt a holistic approach to CDR, integrating ethical, social, and technological considerations into their strategic planning. Future research should focus on addressing the identified gaps and exploring the long-term impacts of CDR practices, ensuring that companies can effectively contribute to a responsible and sustainable digital economy.

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Appendix A – Database CDR literature reviews (28 studies, in alphabetical order)

	Authors	Year	Title	Outlet	Research Methodology	Region	Key Insights
1.	Aldboush, H.H.H.; Ferdous, M.	2023	Building Trust in Fintech: An Analysis of Ethical and Privacy Considerations in the Intersection of Big Data, AI, and Customer Trust	International Journal of Financial Studies	Systematic Literature Review	Jordan	• Key insights from the paper emphasize the importance of safeguarding customer data, complying with data protection laws, and promoting corporate digital responsibility. • The study provides practical suggestions for companies to enhance trust in fintech services through measures like encryption techniques, transparency regarding data collection and usage, customer opt-out options, and staff training on data-protection policies.
2.	Altmeppen, K.D.; Filipović, A.	2019	Corporate Digital Responsibility. Zur Verantwortung von Medienunternehmen in digitalen Zeiten	Communicatio Socialis	Theoretical Analysis and Literature Review	Germany	• The paper highlights various ethical challenges posed by digitalization, including issues related to algorithms, data privacy, artificial intelligence, and the impact on public communication.

	Authors	Year	Title	Outlet	Research Methodology	Region	Key Insights
							• It discusses the dual nature of digitalization, which brings both opportunities (e.g., transparency, participation) and challenges (e.g., commercialization, manipulation, loss of credibility). • The authors review several initiatives aimed at promoting CDR, such as the German Federal Ministry of Justice and Consumer Protection's CDR initiative and the activities of the Zentrum Digitalisierung Bayern. • These initiatives aim to develop principles and guidelines for CDR, encouraging companies to voluntarily adopt ethical practices beyond legal requirements. • The paper argues for the integration of CDR into media ethics, proposing that media companies have a unique societal responsibility due to their role in public communication. • It calls for a systematic approach to defining and implementing CDR, considering the specific responsibilities of media organizations in the digital age. • They emphasize the importance of interdisciplinary collaboration and the inclusion of philosophical and social science perspectives in the ongoing discourse on digital responsibility.
3.	Bednarova, M.; Serpeninova, Y.	2023	Corporate digital responsibility: bibliometric landscape – chronological literature review	International Journal of Digital Accounting Research	Bibliometric Literature Review Data Collection (Scopus, Web of Science, and Google Scholar) Analysis Tools (VOSviewer, Google Trends) Analytical Instruments (inbuilt tools in Scopus and Web of Science)	Slovakia	• Emergence and Importance of CDR: The study highlights the rapid development and increasing importance of CDR due to the proliferation of new technologies like AI, which raise concerns about privacy, data protection, and ethical considerations. • Regional Leadership: Germany is identified as a leader in CDR efforts, with significant contributions from Spanish and other European scholars. • Bibliometric Trends: There has been a significant increase in publications on CDR, especially from 2020 onwards, driven by the digital transformation accelerated by the COVID-19 pandemic. • Thematic Focus: The research identified key thematic areas in CDR literature, including digital transformation, digital ethics, AI, and data privacy. • Definitions and Frameworks: The paper provides an overview of various definitions and frameworks for CDR, emphasizing its connection to CSR and its role in sustainable development.
4.	Breivogel, S.	2024	Competencies for Corporate Digital Responsibility A Literature and Practice Perspective	BPS Working Paper Series of the Berlin Professional School at the Berlin School of Economics and Law (HWR Berlin)	Systematic Literature Review	Germany	• Competency Framework: A comprehensive set of 23 CDR-related competencies was identified across four domains: cognitive, functional, social, and meta. • Understanding internal and external stakeholder needs and the ability to employ adaptability were highlighted as crucial. • The competency framework can be used by practitioners for recruitment, professional development, and advancing CDR in companies. • The findings are primarily based on experts located in Germany, which may limit the generalizability of the results. Future research could involve a quantitative follow-up study to assess the importance of each identified competency.
5.	Carl, K.V.	2023	Data privacy and security in the context of corporate digital responsibility: A scoping review	Lecture Notes in Informatics (LNI), Proceedings - Series of the Gesellschaft fur Informatik (GI)	Scoping Literature Review	Germany	• The study highlights a growing interest in CDR within IS research, particularly concerning data privacy and security. • It emphasizes the need for a more comprehensive view on data privacy and security within the broader context of CDR, rather than isolated approaches. • The research indicates that corporate responsibilities, such as data privacy and security, are interwoven and should be evaluated in an interconnected manner across different sub-fields of CDR. • Practical Implications: The findings suggest that a holistic approach to data privacy and security, employing the concept of CDR, can help practitioners better implement corporate responsibilities in practice.
6.	Carl, K.V.	2021	Corporate Digital Responsibility: Evaluating Privacy and Data Security Activities on Company-level	Lecture Notes in Informatics (LNI), Proceedings - Series of the Gesellschaft fur Informatik (GI)	Literature Review (incl. Theoretical Framework Development, and Benchmark Corpus Creation)	Germany	• It highlights privacy and data security as critical components of CDR, proposing specific norms and measures for evaluating these activities at the company level. • The study introduces a benchmark corpus to evaluate CDR activities, focusing on seven sub-dimensions of privacy and data security, such as data collection, purpose specification, data use, transparency, secure storage, data quality, and user access and correction. • The benchmark corpus serves as a guideline for companies to assess and improve their CDR activities, aiming to enhance ethical and responsible digital practices.
7.	Carl, K.V.; Hinz, O.	2024	What we already know about corporate digital responsibility in IS research: A review and conceptualization of potential CDR activities	Electronic Markets	Systematic Literature Review	Germany	• Advances in New Technologies: The paper discusses how new technologies affect both private and professional lives, presenting new opportunities and threats for companies, consumers, and society. • Concept of CDR: It emphasizes the growing importance of CDR in enabling technologies that benefit humanity beyond mere technological advancements. • Systematic Understanding: The study aims to provide a more concrete and deeper understanding of the concept's scope by drawing on available knowledge in the field of Information Systems (IS) and electronic markets. • Classification of CDR Activities: The paper develops an in-depth classification of potential CDR activities, contributing to the conceptualization of CDR and anchoring the concept in the context of electronic markets to foster human and social value creation

	Authors	Year	Title	Outlet	Research Methodology	Region	Key Insights
8.	Cheng, C.; Zhang, M.	2023	Conceptualizing Corporate Digital Responsibility: A Digital Technology Development Perspective	Sustainability (Switzerland)	Mixed Methods Approach (Literature Review and Empirical Research (Survey among high-technology enterprises listed on the Shanghai and Shenzhen stock exchanges in China. The survey targeted executives in charge of digital business, focusing on their practices and perceptions related to CDR))	China	• The authors propose a new conceptualization of CDR by distinguishing it into two main components: corporate digitized responsibility and corporate digitalized responsibility. Corporate digitized responsibility includes unbiased data acquisition, data protection, and data maintenance. Corporate digitalized responsibility involves appropriate data interpretation, objective predicted results, and tackling value conflicts in data-driven decision-making. • Measurement of CDR: The study develops a series of measurements for CDR, identifying 15 indicators corresponding to the digitization and digitalization stages. These measurements were tested for their impact on corporate digital performance. • Empirical Findings: The empirical analysis demonstrated a positive relationship between CDR and corporate digital performance. The study found that digitization (data-related practices) is slightly more important than digitalization (application of digital technology) in promoting corporate digital performance. • Managers should emphasize CDR issues as they significantly influence a firm's digital performance. Ethical challenges in data creation, transfer, and storage should be addressed to ensure unbiased data acquisition, data protection, and data maintenance. Companies should develop appropriate tools for data interpretation and prediction, and address value conflicts in data-driven decision-making.
9.	Covucci, C.; Confetto, M. G.; Kljucnikov, A.; Panait, M.	2024	Unrevealing the nexus between Digital Sustainability and Corporate Digital Responsibility: a dual-track systematic literature review Authors affiliation and contact information	SSRN	Dual-Track Systematic Literature Review (with 202 studies)	Italy	• The interconnectedness of Digital Sustainability (DS) and CDR. • A convergence on the crucial role of digital technology in achieving sustainable development. • The potential for integrating DS and CDR into a unified framework, leading to the concept of Corporate Digital Sustainability (CDS).
10.	Elliott, K.; Price, R.; Shaw, P.; Spiliotopoulos, T.; Ng, M.; Coopamootoo, K.; van Moorsel, A.	2021	Towards an Equitable Digital Society: Artificial Intelligence (AI) and Corporate Digital Responsibility (CDR)	Society	Literature Review	United Kingdom	• Ethical AI Principles: The paper identifies over 160 ethical AI principles, highlighting the complexity and fragmentation in current AI governance frameworks. • CDR is proposed as a collaborative mechanism to address the governance complexity of AI and to promote an equitable digital society. • AI Governance: The authors emphasize the need for harmonized and aligned approaches to AI governance, advocating for responsible corporate actions to avoid digital societal harms. • Public Trust and Transparency: The paper discusses the importance of transparency, responsibility, and stewardship in building public trust in AI systems. • Digital Society and Surveillance Capitalism: The authors explore the concept of surveillance capitalism and its implications for digital society, emphasizing the need for ethical oversight and governance. • Regulatory Challenges: The paper reviews the new EU AI regulation and its potential impact, noting the challenges in achieving compliance and the risk of a "tick-box" compliance culture.
11.	Herden, C. J.; Alliu, E.; Cakici, A.; Cormier, T.; Deguelle, C.; Gambhir, S.; ... & Edinger-Schons, L. M.	2021	"Corporate Digital Responsibility" New corporate responsibilities in the digital age	Sustainability Management Forum	Mixed Methods Approach Qualitative: Literature Review Quantitative: Online Survey with 509 US-based Respondents	Germany	• The survey revealed both opportunities (e.g., better services, reduction of repetitive work) and threats (e.g., cybercrime, data security issues) associated with digitalization. • CDR Topics: The authors identified 20 key topics related to CDR, categorized under the ESG framework, including energy and carbon footprint, digital waste, digital well-being, data security, and robot ethics. • A five-step guide for companies to develop and implement a CDR strategy, emphasizing the need for continuous updates and alignment with company goals and culture.
12.	Ivancic, R.; Giermindl, L.	2023	Corporate Digital Responsibility - opportunities and obstacles for businesses and information systems research	CNow Workshop	Literature Review	Switzerland	• Research Gaps: The paper identifies significant research gaps in understanding and implementing CDR, particularly in the deontological, utilitarian, and situational dimensions of ethics. • Systemic Constraints and Self-Interests: Companies often face tensions between exploiting digital technologies for profit and adhering to ethical standards. The voluntary nature of CDR commitments and the lack of effective measurement tools for CDR activities are highlighted as major obstacles. • Push and Pull Mechanisms for CDR: The paper discusses strategic approaches to promoting CDR, including market-driven (outside-in) and resource-based (inside-out) perspectives. It suggests the creation of global authorities to monitor and enforce CDR and emphasizes the importance of value-based management principles. • Implementation Challenges: The paper underscores the need for collaboration between academia and industry to address the implementation challenges of CDR. It calls for raising awareness, educating stakeholders, and providing concrete guidance for companies to integrate CDR into their operations.
13.	Jelovac, D.; Ljubojević Č; Ljubojević L.	2022	HPC in business: the impact of corporate digital responsibility	Digital Policy, Regulation and Governance	Literature Review	Serbia	• RQ: How and in what way does CDR influence digital trust? • The implementation of HPC in business is accompanied by a certain extent of mistrust, necessitating the building of digital trust among stakeholders.

	Authors	Year	Title	Outlet	Research Methodology	Region	Key Insights
			on building digital trust and responsible corporate digital governance				• The study found a correlation between CDR and digital trust, although previous research did not elaborate on this explicitly. • The indirect influence of digital trust via CDR was explored through a new conceptual model that presented the influence of total CDR on digital trust as well as the influence of specific CDR dimensions on particular dimensions of digital trust.
14.	Jones, P.; Comfort, D.	2021	Corporate digital responsibility challenges for sports betting companies	Journal of Gambling Issues	Literature Review	United Kingdom	• Emergence of Digital Technologies: Digital technologies have significantly transformed the sports betting industry, creating new opportunities but also introducing various responsibility challenges. • Privacy and Cybersecurity: Sports betting companies face significant challenges in protecting customer data from sophisticated hacking and malicious software. • Trust: Maintaining customer trust is crucial, especially regarding the safety of their financial and personal information. • Protection of Vulnerable Customers: There are concerns about digital technologies promoting addictive and compulsive gambling behaviours. Companies emphasize responsible gambling but face scrutiny over their actual practices. • The paper discusses the balance between self-regulation by sports betting companies and government regulation. It highlights the ongoing review of gambling legislation in the UK to address digital era challenges.
15.	Knopf, T.; Pick, D.	2023	Corporate Responsibility for Digital Innovation: A Systematic Review of the Literature	Proceedings of the European Conference on Innovation and Entrepreneurship (ECIE)	Systematic Literature Review with PRISMA Guidelines	Germany	• The authors propose a unified definition of CDR and suggest a comprehensive framework based on the ESG (Environmental, Social, and Governance) criteria. They emphasize the importance of context-specific adaptations for different industries and cultures. • The scope of beneficiaries of CDR activities needs further exploration to understand motivations and impacts. • A clearer understanding of CDR can guide the development of practical strategies for organizations. Establishing a shared understanding of CDR is essential for developing effective strategies to address the ethical, social, and environmental impacts of digital technologies.
16.	Kunz, W.; Wirtz, J.	2023	Corporate digital responsibility (CDR) in the age of AI: implications for interactive marketing	Journal of Research in Interactive Marketing	Literature Review	Singapore	• One of the first paper in the service domain to apply the concept of CDR to recent developments in generative AI. • Analyses the importance of considering the ethical implications of AI in interactive marketing and the concept of CDR as it relates to new advances in AI. • Underlines the risks involved when companies do not prioritize good CDR practices, the financial benefits and improved customer experience that can come from AI-driven customization, and the trade-offs between organizational goals and CDR practices. • Highlights opportunities for responsible business restructuring and service automation to ensure fairness and human oversight.
17.	Kunz, W.; Wirtz, J.; Hartley, N.; Tarbit, J.	2024	The importance of corporate digital responsibility in a Digital Service World	Emerald Publishing Limited	Literature Review	United Kingdom	• Ethical Implications of AI: The chapter highlights the ethical challenges posed by AI technologies, such as biased decision-making and privacy concerns. • CDR is presented as a framework to address ethical dilemmas in digital service ecosystems. It emphasizes the need for ethical norms, customer privacy, and equitable power dynamics with business partners. • Data and Technology Life Cycles: The chapter discusses the stages of data and technology life cycles (creation, operation, refinement, and retention) and their associated CDR challenges. • Digital Service Ecosystems: It explores the front-end (customer-facing) and back-end (business partners) aspects of digital service ecosystems and the ethical issues arising from data sharing and AI usage. • Generative AI Challenges: The emergence of generative AI technologies like ChatGPT and DALL-E introduces new CDR challenges, including AI complexity, monitoring, accountability, and workforce changes. • Building a Strong CDR Culture: The chapter provides recommendations for service firms to establish a strong CDR culture, including ethical norms, digital governance, and equitable power dynamics with business partners.
18.	Lobschat, L.; Mueller, B.; Eggers, F.; Brandimarte, L.; Diefenbach, S.; Kroschke, M.; Wirtz, J.	2021	Corporate digital responsibility	Journal of Business Research	Literature Review	United States	• The authors identify four principal stakeholders (organizations, individual actors, artificial/technological actors, and institutional/governmental/legal actors) and four key processes (creation of technology and data capture, operation and decision making, inspection and impact assessment, and refinement of technology and data) that are central to CDR. • The paper discusses how to embed CDR within an organization's culture, highlighting the importance of shared values, specific norms, and artifacts and behaviours that reflect CDR principles. • Managerial Implications: The authors provide insights into how organizations can translate their CDR values into actionable guidelines for managers, technology designers, and other employees. They also discuss the potential benefits of a strong CDR culture, including enhanced trust, reputation, and competitive advantage. • The paper identifies several avenues for future research, such as exploring the antecedents and consequences of CDR, developing metrics for assessing CDR readiness and implementation, and understanding the impact of CDR on consumer behaviour and organizational performance.

	Authors	Year	Title	Outlet	Research Methodology	Region	Key Insights
19.	Londoño-Cardozo, J.; Paz, M.P.	2021	Corporate Digital Responsibility: Foundations and Considerations for Its Development	RAM – Mackenzie Management	Hermeneutical Investigation and Literature Review	Brazil	• The paper introduces CDR as a new area of interest for social accountability in the context of Industry 4.0 technologies. • It highlights the lack of sufficient theoretical and legal frameworks to address the implications of new technologies. • The authors argue that new technologies pose social risks, making them a subject of social responsibility. • Despite the absence of regulations on Industry 4.0, the development of CDR is deemed necessary and possible.
20.	Mihale-Wilson, C.; Hinz, O.; Van Der Aalst, W.; Weinhardt, C.	2022	Corporate Digital Responsibility	Business & Information Systems Engineering	Literature Review	Germany	• Need for CDR: The paper argues that while CSR addresses general business responsibilities towards society, CDR specifically focuses on the responsibilities related to the development and use of technology. This distinction is necessary due to the unique challenges and opportunities that digital technologies present. • Characteristics of CDR: CDR encompasses various aspects such as ethical, legal, and social responsibilities in the context of digital technologies. It highlights issues like data privacy, algorithmic transparency, and the ethical use of AI. • Comparison with CSR: The authors compare CDR with CSR, noting that while CSR is broad and encompasses various societal concerns, CDR is more focused on the digital realm. They argue that CDR should be seen as a distinct but related concept to CSR. • Implementation of CDR: The paper discusses how CDR can be operationalized within organizations. It suggests that companies need to develop specific frameworks and action plans to address digital responsibilities effectively. • Opportunities for Research: The authors highlight the importance of further research in the field of CDR, particularly in developing concrete guidelines and best practices for businesses to follow. They also emphasize the role of the Business & Information Systems Engineering (BISE) community in advancing CDR research.
21.	Mueller, B.	2022	Corporate Digital Responsibility	Business and Information Systems Engineering (BISE)	Literature Review	Germany	• The paper identifies two main domains of CDR: a content-oriented perspective on digital ethics and an instrumental perspective on governance. • The paper emphasizes the importance of identifying and considering relevant stakeholders, including internal (e.g., employees) and external (e.g., customers, regulators) actors. • The article explores how organizations can manifest CDR-related norms and values through codified standards, codes of conduct, and embedded ethical guidelines in digital artifacts. • It also examines the processes and structures necessary to enforce CDR within organizations, including centralized and decentralized approaches. • The paper discusses the potential impacts of CDR on economic, social, and environmental aspects. It suggests that adopting CDR can enhance an organization's reputation, attract talent, and appeal to investors, thereby providing a competitive advantage.
22.	Orbik, Z.; Zozuľaková, V.	2019	Corporate Social and Digital Responsibility	Management Systems in Production Engineering	Literature Review	Poland	• The paper highlights the growing importance of integrating CSR with digital transformation, emphasizing that digital maturity is crucial for modern businesses to remain competitive. • Digital transformation is identified as a key driver of the Fourth Industrial Revolution, fundamentally changing business processes, models, and the work environment. • The authors introduce CDR as a new dimension of CSR, focusing on the ethical use of digital technologies and the responsible management of digital transformation within organizations. • The authors provide strategic recommendations for businesses to successfully integrate digital technologies and CSR, including long-term planning, organizational flexibility, and fostering a digital culture.
23.	Van Der Merwe, J.; Al Achkar, Z.	2022	Data responsibility, corporate social responsibility, and corporate digital responsibility	Data and Policy	Literature Review	United States	• The commentary argues that existing CSR and CDR mechanisms are not sufficient for managing data responsibility effectively. It highlights the need for a broader societal and comprehensive approach. • It discusses the emergence of CDR as a concept and its overlap with CSR, while arguing that CDR should be treated as a separate mechanism due to the unique challenges posed by digital transformation. • The authors suggest that data responsibility should be embedded throughout the entire business cycle and not treated as an afterthought. They also call for stronger enforcement and accountability mechanisms.
24.	Volkov, V.R.; Sidorenko, E.L.	2022	Digital Platforms and Issues of Corporate Criminal Responsibility, Self-regulation	Lecture Notes in Networks and Systems	Literature Review	Russia	• The paper emphasizes that corporations can be subject to criminal punishment for crimes, integrating this responsibility within the broader scope of corporate social responsibility. • It discusses the diminishing scope of self-regulation due to increasing state regulation, highlighting the need for internal control mechanisms within corporations. • The authors introduce concepts like "digital social responsibility" and "corporate digital responsibility," stressing the lack of a unified scientific direction for developing corporate responsibility provisions on digital platforms. • Legal Models: The paper calls for collaborative efforts among scientists to justify and explain the effectiveness of different legal models for corporate responsibility in the digital age.

	Authors	Year	Title	Outlet	Research Methodology	Region	Key Insights
25.	Wagener, A.	2022	Corporate Digital Responsibility und KI Bias	Hofer Beiträge zur digitalen Transformation	Literature Review	Germany	• Key Areas of CDR: • Resource Conservation: Efficient use of energy in digital services and products. • Social Compatibility: Creating humane work environments with digital technology. • Democratization of Digitalization: Enhancing access through skill-building and promoting accessible digital infrastructure. • Data Security and Privacy: Preventing misuse of data power, combating surveillance capitalism, and ensuring transparency in AI decision-making. • Challenges and Solutions: • Identifying applicable value standards is challenging due to societal fragmentation and evolving norms. • The paper calls for the development of tools that address both technical and organizational requirements for effective CDR management. • It stresses the importance of integrating business objectives with societal concerns to create a comprehensive CDR strategy.
26.	Wilkinson, C.	2023	Corporate digital responsibility: The influence of digitalisation on sustainable corporate development	FOM Hochschule für Oekonomie & Management	Literature Review	Germany	• Digitalisation's Dual Role: Digitalisation supports daily activities but also poses significant threats that need to be addressed. • Companies have a responsibility to act as multipliers by setting a good example in sustainable practices. • The paper highlights the importance of addressing global challenges such as climate change, loss of biodiversity, and pollution.
27.	Wirtz, J.; Kunz, W.H.; Hartley, N.; Tarbit, J.	2023	Corporate Digital Responsibility in Service Firms and Their Ecosystems	Journal of Service Research	Literature Review / Multi-disciplinary Literature Synthesis Approach	United States	• The paper highlights that CDR is critical in service contexts due to the vast streams of customer data involved and the omnipresence, opacity, and complexity of digital service technologies. • The authors synthesize literature on ethics, privacy, and fairness using the CDR data and technology life-cycle perspective to better understand these risks in service contexts. • The paper examines the digital service ecosystem and the related flows of money, service, data, insights, and technologies to provide insights into the origins of CDR risks. • The authors introduce the concept of the CDR calculus, which captures the trade-offs between good CDR practices and organizational objectives. They argue that regulation is necessary when a firm's CDR calculus becomes too negative. • The paper advances a set of strategies, tools, and practices that service firms can use to manage these trade-offs and build a strong CDR culture.
28.	Wynn, M.; Jones, P.	2023	Corporate Responsibility in the Digital Era	Information (Switzerland)	Scoping Literature Review and Case Studies (Walmart and Deutsche Telekom))	United Kingdom	• The paper identifies several key parameters of CDR, including data protection, privacy, security, transparency, and ethical use of digital technologies. • Case Study Findings: • Walmart: Focuses on digital trust commitments, promoting fairness, protecting privacy, and ensuring cybersecurity. • Deutsche Telekom: Emphasizes human-centred technology, digital ethics, digital participation, future work, and environmental impacts. • Emergent Issues: • The paper discusses issues such as fair and equitable access to digital technologies, personal and social well-being, environmental impacts, and the complexities of cross-supply chain digital responsibilities.

Appendix B – Exemplary definitions of CDR in the literature

Authors	Definition
BMUV (2021)	"CDR is a voluntary corporate activity, particularly considering the consumers' perspective, which strives to go beyond what is required by law to shape the digital world for the advancement of society."
Carl et al. (2022)	"CDR activities exceed the legally binding (national) minimum requirements and rather describes the voluntary acceptance of additional responsibilities."
Dörr et al. (2021)	"CDR is a set of practices and behaviours that help an organisation use data and digital technologies in ways that are perceived as socially, economically, and environmentally responsible."
Herden et al. (2021)	''CDR is an extension of a firm's responsibilities which takes into account the ethical opportunities and challenges of digitalization.''
Huber (2022) (translated from German)	"Framework for action and decision-making that shoes how AI risks and opportunities are to be balanced in order to meet the social responsibility of companies with regard to digital issues."
Joynson (2018)	''CDR is about recognizing that the organizations driving forward the advancement of technology, and those that leverage technology to engage and provide services to the citizen, have a responsibility to do so in a manner that is fundamentally leading us toward a positive future.''
Knopf & Pick (2023)	"CDR is a voluntary commitment, beyond what is legally required, that an organisation makes to itself and to society as a whole, as well as to the individual. It is also a framework that guides an organisation's operations by providing a business orientation with a set of practices, behaviours, policies and governance structures based on a set of shared values and norms to achieve economic, social and environmental goals when engaging with stakeholders or shaping the digital world with responsible digital innovation for the advancement of society."

Authors	Definition
Lobschat et al. (2021)	"CDR is the set of shared values and norms guiding an organization's operations with respect to the creation and operation of digital technology and data.''
Mihale-Wilson et al. (2021)	"CDR seeks to ensure an ethical and responsible development, deployment, and use of digital technologies and data", Part of the "obligations that companies have toward society."
Suchacka (2019)	"CDR means that awareness of duties binding the organisations active in the field of technological development and using technologies to provide services."
Trittin-Ulbrich Böckel (2022)	"CDR emphasizes the voluntary, self-regulatory character of corporate commitment to responsible digital innovation."
Weißenberger & Marrocco (2022)	"CDR is a voluntary corporate orientation to ensure a responsible use of digital technologies."
Wirtz et al. (2023)	"We define CDR in the context of service as the principles underpinning a service firm's ethical, fair, and protective use of data and technology when engaging with customers within their digital service ecosystem."
BMUV (2021)	"CDR is a voluntary corporate activity, particularly considering the consumers' perspective, which strives to go beyond what is required by law to shape the digital world for the advancement of society."
Carl et al. (2022)	"CDR activities exceed the legally binding (national) minimum requirements and rather describes the voluntary acceptance of additional responsibilities."
Dörr et al. (2021)	"CDR is a set of practices and behaviours that help an organisation use data and digital technologies in ways that are perceived as socially, economically, and environmentally responsible."
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Trittin-Ulbrich Böckel (2022)	"CDR emphasizes the voluntary, self-regulatory character of corporate commitment to responsible digital innovation."
Weißenberger & Marrocco (2022)	"CDR is a voluntary corporate orientation to ensure a responsible use of digital technologies."
Wirtz et al. (2023)	"We define CDR in the context of service as the principles underpinning a service firm's ethical, fair, and protective use of data and technology when engaging with customers within their digital service ecosystem."

Appendix C – Database CDR practices literature sample (52 studies, in alphabetical order)

	Authors	Year	Title	Outlet	Research Methodology	Region	Key Insights
1.	Aitken, M.; Ng, M.; Horsfall, D.; Coopamootoo, K.P.L.; van Moorsel, A.; Elliott, K.	2021	In pursuit of socially-minded data-intensive innovation in banking: A focus group study of public expectations of digital innovation in banking	Technology in Society	Qualitative Research (Series of five focus groups to explore the role of public deliberation in informing ethical data practices in banking)	United Kingdom	• Deliberative forms of public engagement present valuable opportunities to incorporate diverse views and perspectives, enabling critical reflection on organizational practices and the trajectory of innovation. • The study concludes that public engagement is vital to ensure that private sector organizations move beyond "ethics-washing" or tokenistic efforts at CDR to meaningfully address public concerns and reflect public values in all innovation processes.
2.	Al-Omoush, K.; Ribeiro-Navarrete, B.; McDowell, W.C.	2023	The impact of digital corporate social responsibility on social entrepreneurship and organizational resilience	Management Decision	Quantitative Research (Sample of 223 managers, collecting data from telecommunication companies in Jordan, Smart-PLS to test the research model and hypotheses)	Jordan	• Digital CSR has a significant impact on social entrepreneurship. • Digital CSR significantly impacts organizational resilience. • Digital CSR plays a significant role in competitive intelligence. • Social entrepreneurship significantly impacts organizational resilience. • Competitive intelligence significantly impacts organizational resilience.
3.	Andersen, N. (2020).	2020	Redesigning Corporate Responsibility How Digitalization	Redesigning organizations: Concepts for the	Conceptual	Germany	• Digitalization as a Catalyst: Digitalization offers companies new opportunities to rethink and enhance their corporate responsibility strategies. • Companies should prioritize CDR, addressing gaps that education and regulation cannot fill.

	Authors	Year	Title	Outlet	Research Methodology	Region	Key Insights
			Changes the Role Companies Need to Play for Positive Impacts on Society	connected society			• Treating CDR with high strategic priority can lead to positive outcomes for both businesses and society.
4.	Angermann, N. P.	2023	Corporate Digital Responsibility – An Analysis of Key Elements for CDR Implementation	University Católica Portugal	Mixed Methods Approach (Literature Review, Surveys, and Semi-Structured Interviews)	Germany	• Low Awareness and Partial Implementation: Many companies are partially implementing CDR, often unintentionally and without realizing its full potential. • Overall awareness of CDR is very low. • Challenges in Implementation: Key challenges include a lack of guidance and structure, and the need for a holistic view of economic, social, environmental, and technological factors. • Key Elements for CDR Implementation: • Holistic Integration: CDR must be integrated into the core strategy, considering economic, social, environmental, and technological factors. • Transparency and Communication: CDR must be communicated transparently and comprehensively to all stakeholders. • Beyond Compliance: CDR should go beyond mere compliance with regulations. • Anticipation and Adaptation: In the fast-changing environment of digital innovation, it is important to anticipate consequences and constantly adapt the strategy. • CSR serves as a foundation for CDR implementation due to similar goals, but CDR expands the scope and is seen as the next major strategic shift for companies.
5.	Boin, M.	2022	Farce, Frankenstein, or Future Model? A Policy Evaluation of Germany's Trial to Foster Corporate Digital Responsibility	Central European University	Mixed Methods Approach Qualitative: Interviews (conducted with CDR-practitioners and scientists) Quantitative: Vedung's Goal-Attainment and Side-Effects Model	Austria	• Evaluation of the German CDR-Initiative: The initiative aims to foster CDR by encouraging companies to voluntarily join and comply with certain principles and goals for a human-centred digitalisation. • The initiative is seen as a potential future model for encouraging credible CSR. • Findings from Interviews: The initiative has raised awareness and commitment to CDR among participating companies. The initiative's setup transfers responsibility from consumer choice to companies, creating more awareness and benefiting member companies through exchange, ministerial approval, and media attention. • Societal and Entrepreneurial Added Value: The initiative has societal added value by introducing a standard for CDR and consolidating it as a minimum standard in participating companies. Entrepreneurial added value includes benefits such as enhanced reputation, trust from consumers, and facilitated exchange of best practices among companies. • Challenges and Recommendations: The initiative needs to attract more companies to increase its impact. Providing tools for implementation and integrating CDR into various business promotion activities are recommended to support non-participating companies.
6.	Breivogel, S.	2024	Competencies for Corporate Digital Responsibility A Literature and Practice Perspective	BPS Working Paper Series of the Berlin Professional School at the Berlin School of Economics and Law (HWR Berlin)	Qualitative Research (Systematic Literature Review)	Germany	• Competency Framework: A comprehensive set of 23 CDR-related competencies was identified across four domains: cognitive, functional, social, and meta. • Understanding internal and external stakeholder needs and the ability to employ adaptability were highlighted as crucial. • The competency framework can be used by practitioners for recruitment, professional development, and advancing CDR in companies. • The findings are primarily based on experts located in Germany, which may limit the generalizability of the results. Future research could involve a quantitative follow-up study to assess the importance of each identified competency.
7.	Broers, N.	2023	How Organizations Institutionalize Corporate Digital Responsibility in their Culture and the Influence on Employees' Digital Responsible Behavior	University of Twente	Qualitative Research (Semi-structured interviews with nine employees and five (C-level) managers from five organizations, and Thematic Analysis (TA))	Netherlands	• Drivers of CDR: Board of Directors, Customers, Regulations, Technology, Employees and Marketing Department. • CDR Practices: Environmental Practices: Reducing energy and carbon footprint, waste reduction, and using technology for environmental benefits. Social Practices: Enhancing digital competence, digital well-being, digital inclusion, and being a positive digital influence. Governance Practices: Data security, digital ethics, data privacy, and transparency. • Strategies of Institutional Work: • Creating Legitimacy: Board members' commitment and CDR reports. Sense of Ownership: Involving employees and creating a personal connection to CDR. Employee Ambassadors: Using a network of employees to communicate and educate about CDR. Continuous Informing: Regular communication about CDR developments. Awarding Employees: Gamification, praising responsible behaviour, and providing rewards. • Influence on Employees' Behaviour: Positive Attitudes: Pride and happiness towards the organization's CDR efforts. Subjective Norms: Feeling that CDR is valued by others. Perceived Behavioural Control: Complexity and extra workload associated with CDR. Commitment: Intrinsic motivation and existing organizational culture positively influence CDR behaviour.
8.	Carl, K.V.	2022	The status-quo of companies' data privacy and security communication: An ethical evaluation and future paths	Lecture Notes in Informatics (LNI), Gesellschaft für Informatik	Qualitative Research (Text Analysis with MAXQDA Software)	Germany	• Consumer Expectations: Consumers expect companies to behave ethically and voluntarily assume more responsibilities in the digital context, particularly related to data privacy and security. • The concept of CDR provides a broader perspective on digital responsibilities, integrating data privacy and security into a holistic understanding of corporate responsibilities.

	Authors	Year	Title	Outlet	Research Methodology	Region	Key Insights
							• Communication Practices: The study evaluated current corporate communication regarding data privacy and security from an ethical viewpoint, identifying best practices and future paths for corporate communication. • Best Practices: The research highlighted several best practices for ethically responsible corporate communication, such as transparency in data processing practices, limited data collection, secure data processing, and providing consumers with access to their data. • Challenges for SMEs: Small and medium-sized enterprises (SMEs) often struggle with ethical communication due to a lack of guidelines and best practices, emphasizing the need for further guidance in this area.
9.	Carl, K.V.; Zilcher, T.M.C.; Hinz, O.	2022	Corporate Digital Responsibility and the current Corporate Social Responsibility standard: An analysis of applicability	Lecture Notes in Informatics (LNI), Proceedings - Series of the Gesellschaft fur Informatik (GI)	Conceptual (Theoretical Analysis to evaluate applicability of the existing CSR standard (ISO 26000) to the context of CDR)	Germany	• Applicability of ISO 26000: The ISO 26000 standard covers some aspects of CDR but lacks detailed guidance on digital-specific issues. The authors suggest that either the ISO 26000 standard needs extensive additions or a separate CDR standard should be developed. • Eight Dimensions of CDR: The paper evaluates the applicability of the CSR standard to eight dimensions of CDR: access, dispute resolution and awareness, economic interests, education and awareness, governance and participation, information and transparency, privacy and data security, and product safety and liability. • Need for Standardization: The authors emphasize the need for a specific CDR standard to provide clear guidance for companies on implementing CDR practices, thereby enhancing consumer trust in corporate activities in a digitized world.
10.	Cheng, C.; Zhang, M.	2023	Conceptualizing Corporate Digital Responsibility: A Digital Technology Development Perspective	Sustainability (Switzerland)	Mixed Methods Approach (Literature Review and Empirical Research (Survey among high-technology enterprises listed on the Shanghai and Shenzhen stock exchanges in China. The survey targeted executives in charge of digital business, focusing on their practices and perceptions related to CDR))	China	• The authors propose a new conceptualization of CDR by distinguishing it into two main components: corporate digitized responsibility and corporate digitalized responsibility. Corporate digitized responsibility includes unbiased data acquisition, data protection, and data maintenance. Corporate digitalized responsibility involves appropriate data interpretation, objective predicted results, and tackling value conflicts in data-driven decision-making. • Measurement of CDR: The study develops a series of measurements for CDR, identifying 15 indicators corresponding to the digitization and digitalization stages. These measurements were tested for their impact on corporate digital performance. • Empirical Findings: The empirical analysis demonstrated a positive relationship between CDR and corporate digital performance. The study found that digitization (data-related practices) is slightly more important than digitalization (application of digital technology) in promoting corporate digital performance. • Managers should emphasize CDR issues as they significantly influence a firm's digital performance. Ethical challenges in data creation, transfer, and storage should be addressed to ensure unbiased data acquisition, data protection, and data maintenance. Companies should develop appropriate tools for data interpretation and prediction, and address value conflicts in data-driven decision-making.
11.	Clausen, S.; Braun, L.-M.; Stieglitz, S.	2023	Towards More Digital Wellbeing in Knowledge Work - A Signaling Theory Perspective	IEEE Computer Society	Mixed Methods Approach (Content Analysis of social media accounts of 25 technology companies and Semi-Structured Interviews with 10 students and young professionals)	Germany	• Study identified six categories of digital wellbeing initiatives offered by organizations. • Impact on Organizational Attractiveness: Digital wellbeing initiatives can positively influence organizational attractiveness and job choice, especially among millennials. However, these initiatives are often seen as secondary factors compared to primary job attributes like salary and job content. • Perception of Digital Wellbeing: Many participants were not initially aware of the term "digital wellbeing" and did not always relate their wellbeing issues to ICT use. There is a need for greater awareness and explicit communication about the impact of ICT on wellbeing. • Trust and Credibility: Digital wellbeing initiatives promoted on social media are often viewed with scepticism. Organizations need to ensure that these initiatives are perceived as genuine and not just marketing tools. • Cost and Effectiveness: Participants had difficulty estimating the costs of digital wellbeing initiatives. Organizations should consider communicating the costs and benefits of these initiatives to enhance their credibility and effectiveness.
12.	De Freminville, M.	2020	Corporate governance and digital responsibility	IEEE Xplore	Qualitative Research (Case Studies and Interview with Stakeholders in Corporate Governance and Digital Responsibility Sectors)	France	• Emphasizes the importance of integrating digital responsibility into corporate governance frameworks to enhance trust and sustainability. • Highlights the need for active engagement with stakeholders to address digital risks and opportunities. • Provides recommendations for policymakers to support the implementation of digital responsibility practices in corporations.
13.	Dörr, S.	2021	Corporate Digital Responsibility	Springer	Conceptual (Comprehensive Guideline for Implementing CDR in Practice)	Germany	• A detailed description of how corporate responsibility is changing in the age of big data and artificial intelligence. • Demonstrating how CDR can offer companies a sustainable competitive advantage. • Providing concrete assistance with the digital transformation for companies.

	Authors	Year	Title	Outlet	Research Methodology	Region	Key Insights
							• Inviting executives, corporate responsibility officers, digital ethics experts, sustainability consultants, and anyone interested to learn about the opportunities of responsible digitalization at companies.
14.	Dörr, S.; Lautermann, C.	2024	Beyond direct stakeholders: The extensive scope of Societal Corporate Digital Responsibility (CDR)	Organizational Dynamics	Conceptual	Germany	• The paper defines Societal CDR as the responsibility of companies to consider the impacts of their digital business strategies on societal stakeholders and institutions, beyond just direct stakeholders like employees and customers. • It highlights the difficulties in measuring societal impact and influencing indirect stakeholders, emphasizing the need for businesses to address passive stakeholder groups and societal institutions affected by digitalization. • The authors propose nine "vitality factors" across economic, social, and political domains to guide businesses in assessing their impact on society. These factors include promoting economic equity, enhancing social well-being, and supporting political engagement and transparency. • The paper concludes with practical recommendations for businesses to integrate Societal CDR into their strategies, stressing the importance of inclusivity, ethical practices, and transparency.
15.	Elliott, K.; Copilah-Ali, J.	2024	Implementing corporate digital responsibility (CDR): Tackling wicked problems for the digital era: Pilot study insights	Organizational Dynamics	Mixed Methods Approach (Pilot Study with CDR Sessions, Interviews, Surveys, Workshops and Readiness Reports)	United Kingdom	• Introduces the CDR Framework, which builds on CSR to address the responsibilities arising from digitization. • Highlights the concept of wicked problems, which are complex and difficult to define or solve, requiring iterative management and real stakeholder involvement. • Pilot Study Findings: • Employee Readiness: The survey indicated a high level of readiness among employees to embrace CDR, with 76% actively considering how to incorporate ethical practices within their roles. • Leadership Initiatives: Leadership showed awareness and initiatives towards environmental impact and responsible business practices. • Common Dilemmas: Identified common dilemmas such as the consultancy business model's limitations, cultural fears of hindering innovation, and the risk of CDR becoming a tick-box exercise. • Recommendations: • CDR Champions: Advocates for the role of CDR champions to facilitate organization-wide feedback and embed CDR principles. • Use Cases: Suggests creating CDR use cases to evaluate the cost/benefits of implementing CDR. • Deliberative Leadership: Emphasizes the need for deliberative leadership to embed ethically aligned values and address wicked problems.
16.	Esselmann, F., Golle, D., Thiel, C., & Brink, A.	2020	Corporate Digital Responsibility Unternehmerische Verantwortung als Chance für die deutsche Wirtschaft	Zentrum Digitalisierung.Bayern	Mixed Methods Approach Quantitative: Online Survey (n = 50) Qualitative: Semi-Structured Expert Interviews (n = 12)	Germany	• Over 80% of the surveyed companies have integrated responsible digitalization into their business strategies or specific projects, recognizing the importance of CDR for building consumer trust. • Responsible data handling and privacy are critical areas, driven by both market demands and legal requirements like the GDPR. • Companies view CDR as a means to enhance their competitive position, particularly against firms from the USA and China. Compliance with GDPR is seen as a market differentiator. • There is a stronger demand for responsible technology use in B2B contexts compared to B2C, presenting an opportunity for Germany as an export nation. • Companies face challenges in balancing positive and negative impacts of digitalization, such as improving customer experience while maintaining privacy. • Increasingly, employees demand clear value positioning from their employers, making CDR a tool for attracting and retaining talent. • There is a need for systematic governance and integration of CDR into business processes, beyond ad-hoc management discussions. • Effective CDR implementation requires collaboration across sectors, involving businesses, policymakers, and consumer organizations.
17.	Girrbach, P.	2021	Corporate Responsibility in the Context of Digitalization	Tehnicki Glasnik	Case Study	Croatia	• The paper emphasizes the need to enhance traditional corporate responsibility to include digital aspects, termed as CDR. • It provides insights into how blockchain can be used to improve resource efficiency and transparency in supply chains. • The study highlights the importance of a holistic approach to corporate responsibility, considering economic performance, environmental protection, and social responsibility in the digital age.
18.	Hamadi, H.; Manzo, C.	2021	"Corporate Digital Responsibility" A Study on Managerial Challenges for AI integration in Business	Lund University School of Economics and Management (LUSEM)	Mixed Methods Approach Literature Review (CSR Approaches to Digitalisation) Semi-Structured Interviews (AI Experts and Managers)	Sweden	• The research identifies several managerial challenges in integrating AI into business processes, including the "black box" problem, where managers struggle to understand and explain AI decisions. It emphasizes the importance of a top-down approach to digital responsibility, where leadership sets the tone for ethical digital practices. • The study discusses the concept of technological artifacts as actors, but concludes that they should not be considered as embodying agency in the same way humans do. • It suggests that while AI technologies can influence decisions, the moral responsibility remains with the companies that create and use them. • The research highlights a moral responsibility gap due to the unpredictability of AI outputs. It calls for a collective effort among corporations, governments, and individuals to define and uphold digital ethics.

	Authors	Year	Title	Outlet	Research Methodology	Region	Key Insights
							• The study stresses the need for secure data handling, constant training, and human intervention in AI decision-making processes. • It also points out the reactive nature of laws and regulations, which often lag behind technological advancements.
19.	Hamdallah, M.E.; Srouji, A.F.; Al-Ibbini, O.	2022	Does Perceived Organizational Support Have a Mediating Role in Directing the Relationship Between E-Banking and Corporate Digital Responsibility?	Studies in Computational Intelligence	Quantitative Research (E-Survey with 88 Respondents from the Financial Departments of 16 Jordanian Banks)	Jordan	• E-Banking is a direct element in the dimensional model that indicates a positive relationship with Social Corporate Digital Responsibility (SCDR), Economic Corporate Digital Responsibility (ECDR), and Technological Corporate Digital Responsibility (TechCDR). • Perceived Organizational Support (POS) has a partial positive mediating effect in the relationship between E-Banking and ECDR, and between E-Banking and TechCDR. However, there is no mediating effect in the relationship between E-Banking and SCDR.
20.	Herden, C. J.; Alliu, E.; Cakici, A.; Cormier, T.; Deguelle, C.; Gambhir, S.; ... & Edinger-Schons, L. M.	2021	"Corporate Digital Responsibility" New corporate responsibilities in the digital age	Sustainability Management Forum	Mixed Methods Approach Qualitative: Literature Review Quantitative: Online Survey with 509 US-based Respondents	Germany	• The survey revealed both opportunities (e.g., better services, reduction of repetitive work) and threats (e.g., cybercrime, data security issues) associated with digitalization. • CDR Topics: The authors identified 20 key topics related to CDR, categorized under the ESG framework, including energy and carbon footprint, digital waste, digital well-being, data security, and robot ethics. • A five-step guide for companies to develop and implement a CDR strategy, emphasizing the need for continuous updates and alignment with company goals and culture.
21.	Jones, P.	2023	Corporate Digital Responsibility in the Retail Industry: Cameo Case Studies of Two German Retailers	Athens Journal of Business & Economics	Cameo Case Study (Rewe Group and Otto Group, illustrate how they are addressing CDR)	Greece	• Rewe Group: Focuses on ethical data use, data protection, and the responsible use of digital technologies. The company developed an AI manifesto to guide the ethical use of AI. • Otto Group: Launched the "Future Values Initiative" to promote social discourse on the opportunities and challenges of digitization. The initiative aims to integrate sustainability and digitization. • Reflections on CDR: The paper discusses potential internal inconsistencies within CDR, such as tensions between economic and social dimensions. It highlights the importance of transparency and stakeholder involvement in addressing CDR.
22.	Kärpänen, T.	2022	Corporate Digital Responsibility and Accessibility in Digital Services	International Conferences Interfaces and Human Computer Interaction 2022	Qualitative Research (Semi-structured Interviews with eight Finnish Micro-Entrepreneurs)	Finland	• Current Knowledge and Practices: Most interviewees associated accessibility with clear and understandable digital services. Many had tried to create simple and user-friendly digital services without knowing these were accessibility features. Challenges included a lack of knowledge, resources, and proper testing with users. • Understanding of Legislation: All participants were familiar with the GDPR but not with the Web Accessibility Directive or Finland's national legislation based on it. There was a general lack of awareness about future legislation requirements for SMEs under the European Accessibility Act (EAA). • Role of Accessibility in CDR: Accessibility in digital services is part of the Corporate Digital Responsibility (CDR) framework, falling under the 'social' and 'governance' domains. Legal requirements like the GDPR influence CDR culture, emphasizing the need for accessible and understandable digital services.
23.	Kempkes, E.; Kempkes, J.A.; Suprano, F.; Wömpener, A.	2021	Corporate Digital Responsibility	Controlling & Management Review	Qualitative Research (Analysis of Business and Sustainability Reports to systemize CDR action fields)	Germany	• Many aspects of digital corporate responsibility can be integrated into the CSR concept. However, new responsibilities, particularly related to trustworthy AI technologies and IT security, require additional focus. • Companies need to develop a comprehensive CDR strategy to address these new responsibilities. This includes identifying relevant CDR action fields, managing and evaluating all CDR activities, and effectively communicating these to stakeholders. • The paper provides a framework for companies to derive CDR measures from business practice. It highlights the importance of continuous monitoring and adaptation of these measures to ensure they meet evolving societal expectations. • Focus Areas: • Ecological Dimension: Addressing the digital CO_2 footprint and managing digital waste. • Social Dimension: Ensuring responsible workplace design and digital health. • Digital Dimension: Developing ethical standards for AI, ensuring IT security, and maintaining data sovereignty and transparency.
24.	Kivistö, M.	2024	The balance between corporate digital responsibility and organizational benefit	LUT School of Business and Management	Qualitative Research (Semi-structured Interviews with two Groups: Employees of a Finnish Media Agency and	Finland	• The concept of CDR is relatively new and not widely understood. Companies often equate digital responsibility with legal compliance rather than a holistic set of values and norms. • There are ethical concerns related to the type and amount of data collected, how it is collected, and its potential misuse. Companies often collect more data than necessary, which can be ethically problematic. • GDPR has significantly improved digital responsibility practices, but there are still challenges in understanding and implementing regulations. Legislation is seen as a positive force that helps protect consumer privacy and rights.

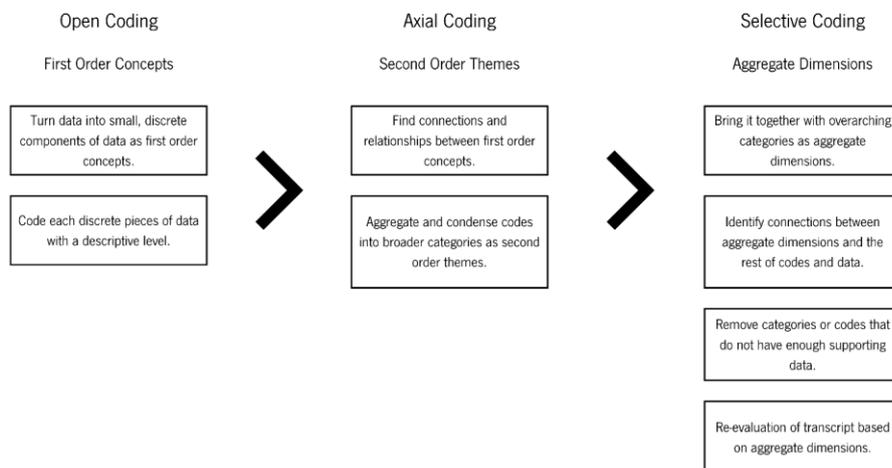|	Authors	Year	Title	Outlet	Research Methodology	Region	Key Insights
					Regular Consumers)		• Reporting on CDR could be beneficial for both internal and external stakeholders. It could enhance consumer trust and potentially influence consumer behaviour, although it might not necessarily become a competitive advantage. • The future of data-driven marketing is seen as challenging due to the deprivation of third-party cookies and stricter regulations. However, it is also viewed as an opportunity to develop new solutions and adapt to changes. • Consumers value their privacy highly but often do not act in accordance with their stated concerns due to the privacy paradox. They prefer clear and brief information about how their data is used and would appreciate certifications indicating responsible data practices.
25.	Kluiters, L.; Srivastava, M.; Tyll, L.	2023	The impact of digital trust on firm value and governance: an empirical investigation of US firms	Society and Business Review	Quantitative Research Create Combined Digital Trust Score with Data Collection from US firms, 2011-2016 Linear Regression (Effect of firm- and governance-specific characteristics on digital trust)	Czech Republic	• Firm Profitability and Size: A firm's profitability (measured by return on assets, ROA) decreases while its size increases Digital Trust (DT). This suggests that firms with lower DT might monetize data more actively, decreasing DT but increasing short-term profitability. • Digital Trust and Firm Value: Increasing DT leads to an increase in firm value. This highlights the importance of cybersecurity investments and their positive impact on shareholder value and consumer perceptions. • The study extends the knowledge of CDR by providing a novel method for calculating DT across industries. It emphasizes how firms can enhance DT through firm- and governance-level factors, subsequently increasing firm value. • Managerial Implications: The study provides empirical evidence that investments in cybersecurity and digital trust can increase firm value, suggesting that these should be viewed as value drivers rather than cost drivers.
26.	Lautermann, C.; Frick, V.	2023	Corporate Digital Responsibility	IÖW-Schriftenreihe	Conceptual	Germany	• Comprehensive CDR Framework: The study outlines a broad CDR framework applicable to companies across various industries, not just IT firms. • Six Responsibility Areas: These include digital ethics & compliance, digital governance, digital accountability, digital strategy, employee data protection, and ecological responsibility in digitalized production. • Stakeholder Engagement: The framework emphasizes the importance of engaging with stakeholders, including employees, customers, and supply chain partners, in the context of digital transformation. • Policy and Society: It highlights the role of companies in promoting digital literacy, sharing knowledge with society, and responsibly influencing digital policy.
27.	Liu, H.; Han, P.; Wang, S.	2023	Enhancing corporate social responsibility in the digital economy era: Evidence from China	Heliyon	Quantitative Research Statistical analysis for the impact of digital economy on CSR Database: Chinese listed companies over the period from 2013 to 2021	China	• The digital economy significantly promotes CSR performance among companies, especially state-owned and large-scale enterprises. • The digital economy facilitates CSR fulfilment across financial, human, and social capital levels, with the most significant impact observed at the human capital level. • The digital economy improves CSR by alleviating financial constraints, facilitating digital transformation, and enhancing the transparency of internal control information within enterprises. • The study suggests that government support for digital finance applications and investments in digital infrastructure can further enhance CSR performance.
28.	Liyanaarachchi, G.; Deshpande, S.; Weaven, S.	2020	Market-oriented corporate digital responsibility to manage data vulnerability in online banking	International Journal of Bank Marketing	Conceptual	Australia	• Managing consumer data vulnerability requires a unique strategy different from conventional service delivery. • A holistic approach is recommended by integrating corporate digital responsibility as a pivotal element of organizational strategy. • Vulnerable customers should be positioned as a critical stakeholder. • The paper introduces an innovative set of consumer segments based on data vulnerability and a data vulnerability growth model (DVGM) connecting vulnerability with age.
29.	Londoño-Cardozo, J.; Paz, M.P.	2021	Corporate Digital Responsibility: Foundations and Considerations for Its Development	RAM – Mackenzie Management	Qualitative Research (Hermeneutical Investigation and Literature Review)	Brazil	• The paper introduces CDR as a new area of interest for social accountability in the context of Industry 4.0 technologies. • It highlights the lack of sufficient theoretical and legal frameworks to address the implications of new technologies. • The authors argue that new technologies pose social risks, making them a subject of social responsibility. • Despite the absence of regulations on Industry 4.0, the development of CDR is deemed necessary and possible.
30.	Marengo, C.L.	2023	Corporate Digital Responsibility -Does it Pay to be Good? Understanding how active CDR can lead to a Competitive Advantage for Firms	University Católica Portugal	Mixed Methods Approach Quantitative: Survey	Portugal	• Active CDR can lead to performance benefits for companies, such as improved access to certain markets, differentiation, stakeholder involvement, and compliance. • The impact of CDR on business performance can be influenced by factors such as company size. • Legislative changes and a shift from voluntary to mandatory CDR are expected to have significant impacts on future business practices.

	Authors	Year	Title	Outlet	Research Methodology	Region	Key Insights
			A mixed-methods study		Qualitative: Guided Interviews (n = 7)		
31.	Merbecks, U.	2023	Corporate digital responsibility (CDR) in Germany: background and first empirical evidence from DAX 30 companies in 2020	Journal of Business Economics	Qualitative Research (Content Analysis with Software MAXQDA of nonfinancial Reports of German DAX 30 Companies from 2020)	Germany	• The study found a significant amount of disclosed information on CDR initiatives, indicating that large German companies are actively addressing digital responsibility. • Most disclosures were related to CDR activities, particularly those concerning customer and employee-related initiatives. • The extent of CDR disclosures varied significantly by industry and company size, with ICT and Chemical industries leading in CDR initiatives. • There was a notable absence of performance-related CDR disclosures and information on CDR-related risks. • The study highlighted the lack of standardized reporting on CDR, suggesting the need for more detailed guidelines and KPIs for meaningful CDR reporting.
32.	Nagano, A.	2023	Institutional Values and CDR for Green ITC: Transforming E-waste to Ethical Gems	Institute of Electrical and Electronics Engineers Inc	Conceptual	Japan	• The importance of institutional values in shaping corporate behaviour towards environmental sustainability. • A proposed model for integrating institutional values into CDR practices within ICT companies. • The potential for transforming e-waste into ethical gems through responsible management and recycling practices.
33.	Napoli, F.	2023	Corporate Digital Responsibility: A Board of Directors May Encourage the Environmentally Responsible Use of Digital Technology and Data: Empirical Evidence from Italian Publicly Listed Companies	Sustainability (Switzerland)	Quantitative Research (Data from Sustainability Reports of 53 publicly listed Italian Companies from 2014 – 2018)	Italy	• The study found that a higher level of board independence is associated with better environmental performance. Independent directors are more likely to push for environmentally responsible practices. • There was no direct, statistically significant association between the use of digital technologies (ERP systems) and environmental performance. However, in firms with a high proportion of independent directors, the use of digital technologies positively influenced environmental performance. • The research highlighted the importance of CDR, showing that the presence of independent directors on a board positively impacts CDR practices. This includes using data and digital technologies in environmentally responsible ways.
34.	Pelters, E.	2021	Corporate Digital Responsibility—Understanding and Applying	Springer Proceedings in Business and Economics	Qualitative Research (Scenario Technique)	Germany	• The paper proposes a solution for evolving the CSR concept into CDR, considering economic, ecological, and social aspects of sustainability in both physical and digital environments. • The scenario technique is shown to be adaptable to contexts beyond companies, such as universities. It highlights the importance of a close exchange between universities and the state for successful implementation. • Impact of the COVID-19 Pandemic: The pandemic accelerated digital transformation in universities, revealing both challenges and opportunities. The findings emphasize the need for a balanced approach combining digital and physical teaching methods.
35.	Rugeviciute, A.	2023	Analysis and modelling of socio-environmental impacts of Corporate Digital Responsibility	CEUR Workshop Proceedings	Mixed Methods Approach Quantitative: Mathematical modelling Qualitative: Literature Review	France	• Organizations face challenges in minimizing the negative impacts of ICT while maximizing the positive ones. The research highlights the need for strategies aligned with sustainable development. • The study proposes a framework to assess an organization's degree of CDR implementation and conceptualizes strategic CDR decisions. • The research aims to develop methods to link CDR decisions with socio-environmental impacts, helping organizations make better-informed decisions.
36.	Scarpi, D.; Pantano, E.	2024	"With great power comes great responsibility": Exploring the role of Corporate Digital Responsibility (CDR) for Artificial Intelligence Responsibility in Retail Service Automation (AIRRSA)	Organizational Dynamics	Conceptual	United Kingdom	• The importance of Corporate Digital Responsibility (CDR) in addressing ethical issues unique to digital technology. • The need for comprehensive guidelines beyond legal obligations to ensure ethical and responsible actions in AI applications. • The concept of CDR and its role in shaping Artificial Intelligence Responsibility in Retail Service Automation (AIRRSA). • The link between CDR and AIRRSA lies in responsible data management, which is fundamental for training and developing ethical AI systems. • The paper discusses the managerial applications and tools of CDR in AI retail service automation to identify value for consumers and retail managers.
37.	Schneider, G.	2022	Framing Accountability in Business-to-Government Data Sharing: The Gap Filling Role of Businesses' Corporate Digital Responsibility	European Business Law Review	Qualitative Research (Analysis of existing European Policies, Regulations, and Frameworks related to B2G Data Sharing)	Italy	• Accountability Gaps in B2G Data Sharing: The paper identifies significant accountability gaps in the current B2G data sharing frameworks within the EU. These gaps arise due to the lack of specific regulatory frameworks and the inadequacy of existing public and data protection laws to ensure transparency and accountability. • The study introduces the concept of CDR as a potential solution to these accountability gaps. CDR involves businesses taking on responsibilities that align with both corporate social responsibility (CSR) and legal and ethical obligations related to data management. • Businesses are seen as crucial players in ensuring accountability in B2G data sharing. By adopting CDR, businesses can bridge the gaps left by public and data protection laws, ensuring that data sharing agreements are executed transparently and accountably.

	Authors	Year	Title	Outlet	Research Methodology	Region	Key Insights
							• The paper suggests that businesses should integrate B2G data sharing into their CSR strategies. It also recommends the development of specific regulatory frameworks to govern B2G data sharing, ensuring that both public and private entities are held accountable.
38.	Sidaoui, K.; Mahr, D.; Odekerken-Schröder, G.	2024	Generative AI in Responsible Conversational Agent Integration: Guidelines for Service Managers	Organizational Dynamics	Conceptual (Managerial Guidelines focusing on CDR Culture, Management Structure, and Digital Governance)	Netherlands	• The importance of responsible integration of conversational agents (CAs) like chatbots for service firms to mitigate risks and foster positive outcomes. • The role of generative AI (GenAI) in implementing CDR factors and responsible CA software development lifecycle phases during development and integration. • Guidelines for leveraging GenAI to enhance CDR Culture, incorporate ethical considerations into CDR Management Structure, and enable robust Digital Governance mechanisms to prioritize customer/societal well-being. • A multilevel framework illustrating reinforcing the guidelines through organizational sensemaking processes, and fostering responsible CA integration aligned with ethical principles and societal values.
39.	Singh, R.; Bansal, R.	2022	Role and Benefits of Corporate Digital Responsibility (CDR) in the Public and Private Enterprises in a Digitalization Era	Nova Science Publishers, Inc.	Conceptual	India	• CDR is defined as the set of shared values and norms guiding an organization's actions regarding digital technology and data. It emphasizes the ethical considerations and responsibilities of organizations in the digital age. • The chapter proposes a framework for CDR, highlighting four key processes related to digital technology and data: Creation of technology and data capture, Operation and decision-making, Inspection and impact assessment, Refinement of technology and data • The framework identifies four main stakeholders in CDR: Individual actors (managers, employees, customers), Artificial/technological actors, Organizations, Institutional/governmental/legal actors • The chapter outlines the lifecycle stages of digital technologies and data, emphasizing the need for ethical considerations at each stage. • It discusses how an organization's culture can support CDR by embedding shared values, specific norms, and artifacts/practices that promote ethical behaviour. • The chapter highlights the challenges of implementing CDR, such as ensuring data privacy, promoting digital diversity and inclusion, and ethical AI decision-making. It also discusses the benefits, including improved trust, reputation, and long-term financial performance.
40.	Stahl, B.C.	2024	From Corporate Digital Responsibility to Responsible Digital Ecosystems	Sustainability (Switzerland)	Conceptual	United Kingdom	• The paper explores the concept of CDR and extends it to the idea of responsible digital ecosystems. • It suggests that digital technologies and their responsibilities are best understood using the metaphor of an "ecosystem," which accommodates the complex nature of socio-technical systems. • The article highlights the challenges of ascribing responsibility within digital ecosystems due to their complexity and the difficulty in delineating boundaries. • Emphasizes the importance of systems thinking in understanding and addressing ethical and social issues related to digital technologies. • Introduces the concept of "meta-responsibility," which involves shaping, maintaining, developing, and aligning existing and novel responsibilities within digital ecosystems. • The paper discusses the implications for research and practice, including the need for adaptive governance structures and the importance of aligning research and innovation processes with societal values and expectations.
41.	Tóth, Z.; Blut, M.	2024	Ethical compass: The need for Corporate Digital Responsibility in the use of Artificial Intelligence in financial services	Organizational Dynamics	Conceptual	United Kingdom	• The authors propose an AI accountability framework that combines the locus of morality and moral intensity to assess ethical issues in AI applications. This framework helps managers navigate the complexities of integrating AI into their strategies and operations. • The paper identifies four accountability clusters: • Professional Norms: Ethical guidelines integrated into AI use. • Business Responsibility: Strategic-level decision-making within organizations. • Inter-Institutional Normativity: Collaboration between different institutions for ethical AI use. • Supra-Territorial Regulations: International and inter-sectoral collaborations to create best practices. • CDR Roadmap: The authors provide a CDR roadmap with specific measures and steps for implementing ethical AI use, considering different accountability clusters and time perspectives.
42.	Trittin-Ulbrich, H; Böckel, A.	2022	Institutional entrepreneurship for responsible digital innovation: The case of corporate digital responsibility	Journal of Business Ethics	Qualitative Research	Germany	• Research explores how institutional entrepreneurs construct CDR as an issue to legitimize corporate commitment to responsible digital innovation. • The discursive, relational, and material legitimization of responsible digital innovation through CDR. • The role of multi-stakeholder efforts in shaping a firm's approach to CDR. • Additional topics associated with the issue of CDR. • Theoretical and practical implications for institutional research on digital innovation.
43.	Van Der Merwe, J.; Al Achkar, Z.	2022	Data responsibility, corporate social responsibility, and corporate digital responsibility	Data and Policy	Qualitative Research (Theoretical Analysis and Case Studies)	United States	• The commentary argues that existing CSR and CDR mechanisms are not sufficient for managing data responsibility effectively. It highlights the need for a broader societal and comprehensive approach. • It discusses the emergence of CDR as a concept and its overlap with CSR, while arguing that CDR should be treated as a separate mechanism due to the unique challenges posed by digital transformation.

	Authors	Year	Title	Outlet	Research Methodology	Region	Key Insights
							• The authors suggest that data responsibility should be embedded throughout the entire business cycle and not treated as an afterthought. They also call for stronger enforcement and accountability mechanisms.
44.	Viitikko, V.	2022	Corporate digital responsibility in the context of data-driven marketing	Lappeenranta-Lahti University of Technology LUT	Qualitative Research (Multiple Case-Study Structure with Semi-Structured Interviews with Company Representatives (n = 7) and seven Consumers (n = 7))	Finland	• Common threats identified include loss of privacy, lack of transparency, increasing data breaches, and companies' exclusive decision-making power over data. • Opportunities Identified: Enhanced transparency and efficiency, equal power balance over data, digital privacy and strengthened trust between companies and consumers, sustainable development of digital transformation. • Stakeholder Perspectives: • Company: Focuses on leveraging data for marketing while being aware of the need for digital responsibility. • Consumer: Concerned about privacy and transparency but recognizes the benefits of personalized marketing. • Society: Emphasizes the need for regulations and ethical guidelines to govern digital transformation.
45.	Vo Thai, H.-C.; Hue, T.H.H.; Chen, P.-F.; Tran, M.-L.	2024	Unravelling the influence of human capital and stakeholder engagement on corporate digital responsibility: Implications for firm performance in Southeast Asia enterprises	Corporate Social Responsibility and Environmental Management	Case Study (Data collected from 2106 Enterprises across Vietnam, the Philippines, and Indonesia)	United States	• The importance of human capital and stakeholder engagement in formulating and executing CDR strategies. • The impact of CDR strategies on firm performance in Southeast Asian enterprises. • The moderating role of stakeholder engagement in the effectiveness of CDR approaches. • Practical implications for organizations to navigate responsible digital practices within the context of Southeast Asian enterprises.
46.	Volkov, V.R.; Sidorenko, E.L.	2022	Digital Platforms and Issues of Corporate Criminal Responsibility, Self-regulation	Lecture Notes in Networks and Systems	Qualitative Research (Literature Review)	Russia	• The paper emphasizes that corporations can be subject to criminal punishment for crimes, integrating this responsibility within the broader scope of corporate social responsibility. • It discusses the diminishing scope of self-regulation due to increasing state regulation, highlighting the need for internal control mechanisms within corporations. • The authors introduce concepts like "digital social responsibility" and "corporate digital responsibility," stressing the lack of a unified scientific direction for developing corporate responsibility provisions on digital platforms. • Legal Models: The paper calls for collaborative efforts among scientists to justify and explain the effectiveness of different legal models for corporate responsibility in the digital age.
47.	Wagener, A.	2022	Corporate Digital Responsibility und KI Bias	Hofer Beiträge zur digitalen Transformation	Qualitative Research (Literature Review)	Germany	• Key Areas of CDR: • Resource Conservation: Efficient use of energy in digital services and products. • Social Compatibility: Creating humane work environments with digital technology. • Democratization of Digitalization: Enhancing access through skill-building and promoting accessible digital infrastructure. • Data Security and Privacy: Preventing misuse of data power, combating surveillance capitalism, and ensuring transparency in AI decision-making. • Challenges and Solutions: • Identifying applicable value standards is challenging due to societal fragmentation and evolving norms. • The paper calls for the development of tools that address both technical and organizational requirements for effective CDR management. • It stresses the importance of integrating business objectives with societal concerns to create a comprehensive CDR strategy.
48.	Wagner, D.; Tąkiel, M.; Dąbrowski, P.	2023	The Paradigm of Corporate Digital Responsibility and Challenges to Its Implementation in a Law Firm	Koźmiński University	Qualitative Research (Literature Review)	Poland	• Strategic Approach for Law Firms: • Law firms need to balance providing high-quality services with maintaining responsible and ethical business practices. • Emphasis on legal tech and cloud storage as key drivers for CDR in law firms. • Measuring CDR Maturity: • Two main groups of indicators: measures of effort and measures of result. • Importance of external evaluation and cooperation with specialized providers for technical aspects. • Future Directions: • Integration of CDR into broader strategic perspectives, such as the Balanced Scorecard. • Emphasis on the importance of CDR for sustainable business models and competitive advantage.
49.	Weber-Lewerenz, B.	2020	Corporate digital responsibility in construction engineering: Ethical principles in dealing with digitization and AI	International Journal of Responsible Leadership and Ethical Decision-Making (IJRLEDM	Qualitative Research (Scientific Questionnaires, Personal and Written Interview Surveys)	Germany	• It highlights the importance of CDR in the construction industry, especially in the context of increasing AI applications. • The research examines the challenges and potential of human-led technologies undergoing digital transformation. • It reviews the status quo and ethical framework by law, differentiating between human and AI to define risks and potential areas of application. • The study underscores the social, educational, economic, and political impacts of AI and digitization, advocating for value-based decision-making.

	Authors	Year	Title	Outlet	Research Methodology	Region	Key Insights
50.	Wilkinson, C.	2023	Corporate digital responsibility: The influence of digitalisation on sustainable corporate development	FOM Hochschule für Oekonomie & Management	Qualitative Research (Literature Review)	Germany	• Digitalisation's Dual Role: Digitalisation supports daily activities but also poses significant threats that need to be addressed. • Companies have a responsibility to act as multipliers by setting a good example in sustainable practices. • The paper highlights the importance of addressing global challenges such as climate change, loss of biodiversity, and pollution.
51.	Wirtz, J.; Kunz, W.H.; Hartley, N.; Tarbit, J.	2023	Corporate Digital Responsibility in Service Firms and Their Ecosystems	Journal of Service Research	Qualitative Research (Multi-disciplinary Literature Synthesis Approach)	United States	• The paper highlights that CDR is critical in service contexts due to the vast streams of customer data involved and the omnipresence, opacity, and complexity of digital service technologies. • The authors synthesize literature on ethics, privacy, and fairness using the CDR data and technology life-cycle perspective to better understand these risks in service contexts. • The paper examines the digital service ecosystem and the related flows of money, service, data, insights, and technologies to provide insights into the origins of CDR risks. • The authors introduce the concept of the CDR calculus, which captures the trade-offs between good CDR practices and organizational objectives. They argue that regulation is necessary when a firm's CDR calculus becomes too negative. • The paper advances a set of strategies, tools, and practices that service firms can use to manage these trade-offs and build a strong CDR culture.
52.	Wynn, M.; Jones, P.	2023	Corporate Responsibility in the Digital Era	Information (Switzerland)	Qualitative Research (Scoping Literature Review and Case Studies (Walmart and Deutsche Telekom))	United Kingdom	• The paper identifies several key parameters of CDR, including data protection, privacy, security, transparency, and ethical use of digital technologies. • Case Study Findings: Walmart: Focuses on digital trust commitments, promoting fairness, protecting privacy, and ensuring cybersecurity. • Deutsche Telekom: Emphasizes human-centred technology, digital ethics, digital participation, future work, and environmental impacts. • Emergent Issues: The paper discusses issues such as fair and equitable access to digital technologies, personal and social well-being, environmental impacts, and the complexities of cross-supply chain digital responsibilities.

Appendix D – Coding Process

Open Coding — First Order Concepts
- Turn data into small, discrete components of data as first order concepts.
- Code each discrete pieces of data with a descriptive level.

Axial Coding — Second Order Themes
- Find connections and relationships between first order concepts.
- Aggregate and condense codes into broader categories as second order themes.

Selective Coding — Aggregate Dimensions
- Bring it together with overarching categories as aggregate dimensions.
- Identify connections between aggregate dimensions and the rest of codes and data.
- Remove categories or codes that do not have enough supporting data.
- Re-evaluation of transcript based on aggregate dimensions.

Appendix E – Summary of emergent core themes and dimensions of CDR practices from the literature

Aggregate Dimensions	Second Order Themes	First Order Concepts	Illustrative Quotes	Example of other Sources addressing Second Order Themes
Organisational culture	1. Digital work environment	Remote work policies, digital collaboration tools, cybersecurity awareness, digital literacy training, inclusive digital practices	Clausen et al. (2023): "Research shows that the abundance of digital technology and constant connectivity can negatively affect employees' wellbeing and performance, for example by causing stress. Therefore, work culture and human resource management measures are needed to prevent such adverse consequences of technology use. One way to do so is to tackle negative effects of ICT use with the help of digital wellbeing initiatives as part of CDR." (p. 4599)	Broers (2023); Angermann (2023); De Freminville (2020)
	2. Responsible digital practices	Ethical use of technology, regular audits and assessments, employee training programs, clear guidelines and policies, continuous improvement and updates	Broers (2023): "The last principle is the accountability principle, which is focussed on who is responsible for ensuring digital responsibility, where organizations can define roles and processes. The principles collectively guide individuals, organizations, and governments to responsible digital behaviour." (p. 9)	Andersen (2020); Carl (2022); Al-Omoush et al. (2023)
	3. Leadership commitment	Transparent leadership, setting the tone for digital responsibility, employee empowerment, inclusive leadership practices, commitment to continuous learning	Elliott & Copilah-Ali (2024): "This leadership approach echoes the core tenets of CDR to inform ethical decision-making for leaders, the organisation and demonstrates a commitment to a shared responsibility towards consumers and the environment. For example, deciding to ascribe to the CDR Manifesto and adopt the logo to demonstrate compliance with CDR core tenets." (p. 7)	Hamadi & Manzo (2021); Napoli (2023); Broers (2023)
Stakeholder engagement	4. Internal stakeholders	Employee engagement, cross-functional collaboration, transparent communication, professional development, workplace well-being	Vo Thai et al. (2024): "Furthermore, this study contributes to the existing literature on CDR and stakeholder engagement by highlighting the role of stakeholder engagement as a moderator. It underscores the importance of actively engaging stakeholders to enhance the link between CDR and firm performance. Specifically, the study demonstrates that utilizing CDR for "Coordinating or collaborating between employees" and actively involving employees can be an effective strategy for SAEs to expand their customer or supplier base." (p. 1936)	Esselmann et al. (2020); Elliott & Copilah-Ali (2024); Broers (2023)
	5. External stakeholders	Customer relationship management, supplier partnerships, community engagement, stakeholder feedback mechanisms, corporate social responsibility	Broers (2023): "At last, CDR is of great importance to other stakeholders such as employees and consumers, as the new digital technologies bring new social issues. This research can stimulate the discourse about CDR, pushing organizations towards digital responsible behaviour." (p. 5)	Boin (2022); De Freminville (2020); Singh & Bansal (2022)
	6. Regulatory & compliance stakeholders	Compliance audits, risk management, regulatory trainings, policy development, stakeholder reporting	Aitken et al. (2021): "Deliberative forms of public engagement present valuable opportunities to incorporate diverse views and perspectives, enabling critical reflection on organizational practices and the trajectory of innovation. The study concludes that public engagement is vital to ensure that private sector organizations move beyond 'ethics-washing' or tokenistic efforts at CDR to meaningfully address public concerns and reflect public values in all innovation processes." (p. 1)	Hamadi & Manzo (2021); Stahl (2024); Singh & Bansal (2022)
	7. Financial stakeholders	Financial transparency, investment in innovation, cost management, shareholder communication, financial risk assessment	Liu et al. (2023): "Therefore, the government should intensify support for inclusive digital finance applications, promote investments in the digital financial infrastructure, raise awareness of the digital economy in less advanced regions, and actively stimulate the growth of digital service scenarios." (p. 10)	Kluiters et al. (2023); Wirtz et al. (2023)
Ethical and responsible use of technology	8. Data & privacy	Data protection policies, user consent management, data anonymization techniques, data breach response plans, privacy impact assessments	Carl (2022): "Broader approaches, like the emerging concept of Corporate Digital Responsibility, make it possible to see responsibility with regard to data privacy and security in the broader context of a company's digital responsibilities and thus to develop a more holistic understanding. However, responsible behaviour alone is not enough; rather an adequate communication is the evaluation basis of consumers." (p. 1)	Cheng & Zhang (2023); Viitikko, (2022); Kärpänen (2022)
	9. Fairness & inclusivity	Bias mitigation strategies, inclusive design practices, diversity training programs, equitable opportunity policies, employee resource groups	Broers (2023): "In addition, the fairness principle promotes fair treatment of others in the digital world and not excluding specific groups. The seventh principle is the norms & values principle, which indicates that organizations should consider human norms and values in the development of products and services, which are important for individuals." (p. 9)	Stahl (2024); Singh & Bansal (2022); Hamadi & Manzo (2021)
	10. Transparency & accountability	Transparent reporting practices, accountability mechanisms, open communication channels, ethical guidelines and standards, regular audits and reviews	Schneider (2022): "This specific responsibility of businesses handling digital assets, as data, is given by the match between businesses' social accountability duties under the more general corporate social responsibility (CSR) framework and the legal and ethical obligations these bear in respect to the design and management of their datasets." (p. 1)	Kunz et al. (2024); Van Der Merwe & Achkar (2022)
	11. Sustainability	Carbon footprint reduction, sustainable supply chain management, waste reduction programs, sustainability reporting, employee engagement in sustainability	Covucci et al. (2024): "CDR as voluntary corporate commitment in planning digital strategies for sustainable development. This perspective expands the scope of CDR to also refer to the planning of corporate strategies and practices designed to act consistently with sustainability principles. It recognizes that the pervasiveness of digital technologies has far-reaching implications that go beyond ethical considerations."	Wilkinson (2023); Jones (2023); Rugeviciute (2023)
Governance and compliance	12. Regulatory compliance	Compliance audits, risk management, regulatory training, policy development, stakeholder reporting	Lautermann & Frick (2023): "Dass CDR keine Einzelleistung eines Unternehmens sein kann, zeigt schließlich auch der Struktur verändernde Charakter zahlreicher Digitaltechnologien. Wenn Big Data, industrielles Internet der Dinge und Blockchain-Technologie Unternehmensgrenzen auflösen, Wertschöpfungsketten reorganisieren und Stakeholder-Beziehungen umdefinieren können, dann stellt sich unmittelbar die Frage nach	Schneider (2022); Hamadi & Manzo (2021); Stahl (2024)

Aggregate Dimensions	Second Order Themes	First Order Concepts	Illustrative Quotes	Example of other Sources addressing Second Order Themes
			der Verantwortbarkeit solcher Disruptionen bzw. ihrer Folgen. Da diese aber per se nicht in der Hand einzelner Unternehmen liegen, kann CDR in dieser Hinsicht nur als Multi-Stakeholder-Governance gelingen. Das bedeutet schließlich: Um die Übernahme von Digitalverantwortung durch Unternehmen zu unterstützen, ja überhaupt erst zu ermöglichen, ist eine politisch-ökonomische Steuerung notwendig, bei der vielfältige Anspruchsgruppen eingebunden werden." (p. 116)	
	13. Risk Management	Risk identification, risk assessment, risk mitigation, risk monitoring, risk reporting	Elliott et al. (2021): "We have focused on "what" needs to be considered in governing AI systems and building trust—risk reduction of the potential harms that technologies inflict on our digital society, whereby the underpinning science is not fully understood. Who is re sponsible to ensure our digital safety as more AI systems are free to operate devoid of human oversight?" (p. 186)	Schneider (2022)
	14. Policy development & implementation	Policy formulation, stakeholder engagement, policy communication, policy implementation, policy evaluation	Aitken et al. (2021): "The findings indicate that deliberative forms of public engagement present valuable opportunities to incorporate diverse views and perspectives and to enable critical reflection on organisational practices and the trajectory of innovation."	Carl et al. (2022); Boin (2022)
	15. Transparency & reporting	Transparent reporting practices, accountability mechanisms, open communication channels, ethical guidelines and standards, regular audits and reviews	Carl et al. (2022): "Existing guidelines related to Corporate Responsibilities, like the ISO standard 26000, provide guidance on Corporate Social Responsibility (CSR) addressing socially responsible and sustainable behaviour. However, current standards do not cover CDR directly. As such, the purpose of this contribution is to evaluate the applicability of the existing CSR standard to CDR to pave the way for CDR standardization in the future."	Kärpänen (2022); Viitikko (2022); Wirtz et al. (2023)
Digital literacy and education	16. Training programs	Needs assessment, customized training modules, blended learning approaches, continuous feedback mechanisms, certification and recognition	Breivogel (2024): "Accepting and responding constructively to feedback might be a crucial competency for effectively implementing CDR in an organization. This requires the ability to accept criticism openly and to learn from one's own mistakes (cf. Interview 4/32). Moreover, CDR professionals should create a setting which provides a safe space for feedback as well as actively embodying a constructive 'no blame culture' (cf. Interview 4/36)." (p.23)	Lautermann & Frick (2023)
	17. Digital ethics education	Ethical frameworks, case studies and scenarios, interactive workshops, ongoing education, ethics committees	Wynn & Jones (2023): "The company has clear governance structures for cybersecurity and information security and reported that its "Information Security Management Policy" is the foundation of its information security programme, and that "this policy applies everywhere Walmart data is stored or processed—within Walmart and outside it—and speaks to the security requirements for assessments, account and device security; personnel security; and awareness and training" [19] (para. 27)." (p. 5)	Mueller (2022); Lautermann & Frick (2023)
	18. Continuous learning & development	Learning culture, personalised learning paths, mentorship programs, learning communities, regular skill assessments	Wynn & Jones (2023): "There are a range of actors and stakeholders involved in CDR, but employees and customers are arguably those most affected. Whilst a number of stakeholders interact with most of these parameters, it is company employees who are at the forefront of CDR related upskilling and redeployment, cultural change and process re-design, and measures and policies aimed at greater data transparency and access. Customers are central to data protection, privacy and security issues, and to the end-to-end theme of building trust across the organisation's interface with the customer through a growing range of digital engagement technologies (social media, chatbots, analytics, big data, AI)." (p. 7)	Lobschat et al. (2021); Lautermann & Frick (2023)
	19. Mentorship & peer learning	Structured mentorship programs, peer learning groups, reverse mentorship, knowledge sharing platforms, recognition and rewards	Breivogel (2024): "As a result of the rapid pace of technological developments it may be important to continuously enhance personal and professional competencies. In this context, knowledge has become increasingly transit, challenging the utility of information in an ever-evolving digital environment (cf. Interview 5/48). This requires constant proactivity in terms of looking for learning opportunities, as well as a high level of receptiveness (cf. Interview 4/38), which can be a considerable challenge, given the diversity of topics in the field of CDR (cf. Interview 6/50)." (p. 24)	Lautermann & Frick (2023)
Innovation and future readiness	20. Research & development	Innovation labs, collaborative research projects, funding and resources, intellectual property management, regular reviews and updates	Angermann (2023): "The connection between sustainable development, CSR and digitalization continues with the topic of responsible innovation. Industry 4.0 is the collective result of the last big innovations and not all of them are based on responsible values." (p. 5)	Aitken et al. (2021)
	21. Agility & adaptability	Flexible work policies, cross-functional teams, continuous improvement processes, rapid prototyping, change management training	Breivogel (2024): "In particular, „understanding internal and external stakeholder needs" and the ability to „employ adaptability" play a crucial role. These results are contextualized and discussed in light of the current academic debate on competencies for implementing CDR."(p. 4)	Kivistö (2024)
	22. Strategic foresight	Scenario planning, trend analysis, foresight workshops, stakeholder engagement, strategic roadmaps	Esselmann et al. (2020): "In diesem Bereich wird bereits intensiv über ethische Fragen digitaler Innovationen nachgedacht. Des halb ist KI oftmals ein Startpunkt für Unternehmen, sich dem Feld CDR zu nähern und sich dabei als zukunftsorientierte Organisation zu präsentieren. Auf der anderen Seite bedeutet dies, dass im deutlich konkreteren Bereich Privacy bisher die DSGVO-Compliance überwiegt und wenige, darüber hinausgehende Aktivitäten von Unternehmen zu erkennen sind." (p. 12)	Mueller (2022)
	23. Collaboration & partnerships	Strategic alliances, joint ventures, community engagement, cross-organisational teams, partnership management	Tóth & Blut (2024): "To address these issues systematically, firms must define the underlying CDR principles (e.g., code of ethics, ethical use of data, accessibility standards, legal compliance) before defining strategic initiatives (e.g., training/education, transparent communication, privacy by design, cross-functional collaboration) and engaging in ongoing activities (e.g., continuous improvements, digital responsibility reporting)." (p. 5)	Ivancic & Giermindl (2023); Esselmann et al. (2020); Altmeppen & Filipović (2019)

Biographical notes

Anna Wannhoff holds a Bachelor's degree in Business Psychology from CBS and a Master's degree in Management from ESMT Berlin, graduating summa cum laude. She is currently pursuing a Doctor of Business Administration at Munich Business School and Sheffield Hallam University, with a research focus on Corporate Digital Responsibility (CDR). Since 2022, she has been working at Microsoft as a Cloud Solution Architect, leading AI adoption initiatives for enterprise clients. Her professional experience includes roles in digital strategy, marketing, and innovation across the tech and mobility sectors. She is a recipient of several academic awards and actively contributes to digital leadership and women empowerment communities.

ORCID: 0009-0002-6335-0414

Markus Westner received a Diploma in Business Administration and Management from EBS University, Wiesbaden, Germany, and a Master's degree in Computing from Unitec, Auckland, New Zealand. He is currently a Professor of IT Management at OTH Regensburg, Germany. Before transitioning to academia, he worked as a management consultant and project manager for one of the world's largest consulting firms. His research focuses on IT strategy and IT sourcing, and he has published extensively in journals and conferences.

ORCID: 0000-0002-6623-880X