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Corporate social responsibility communication in the ICT sector: digital issues, greenwashing, and materiality

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Abstract

Digitalization brings with it new social and governance issues and heightened responsibility, particularly for corporations. In recent years, society has demanded more transparency from companies about digital technology practices, oversight, and impacts. One sector that sharpens the view on these dynamics is information and communication technology (ICT). This study introduces for the first time an examination of corporate social responsibility (CSR) discourse on digital issues among large ICT firms by using signaling theory to analyze a broad set of media (sustainability, ESG, CSR, integrated, impact, purpose, consolidated management, and annual reports as well as issue briefs and webpages). It clarifies how ICT firms present materiality—a reporting concept associated with fair representation and relevance of information—in their CSR reporting on digital topics. It then discusses implications for greenwashing and makes recommendations for improving disclosure credibility.

Keywords Corporate social responsibility, ESG, Sustainability, Information technology, Communication technology, Materiality, Greenwashing, Digital, Cybersecurity, Privacy

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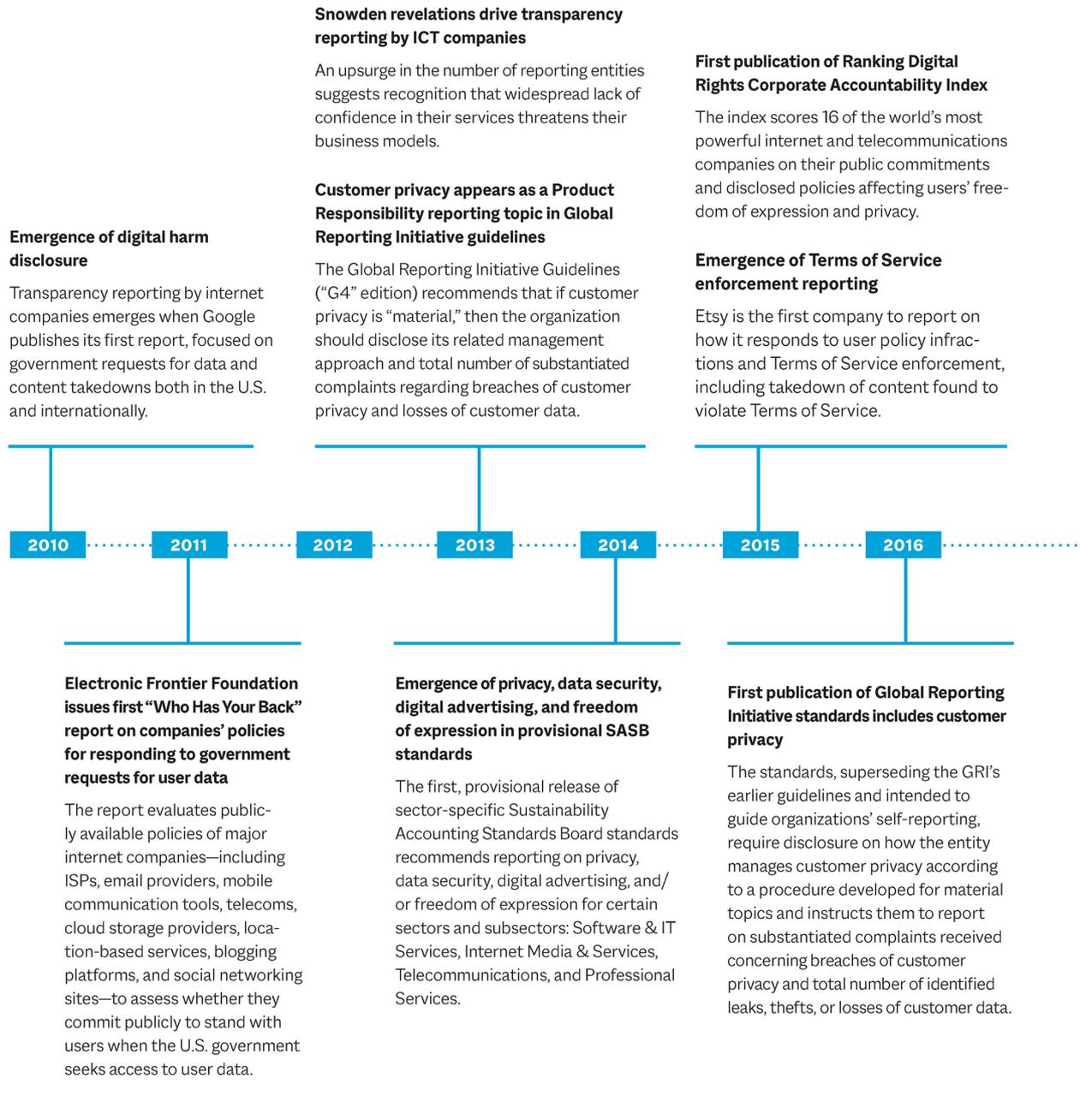
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Graphical Abstract



Introduction

Digitalization brings with it new social and governance issues and heightened responsibility, particularly for corporations (Vial, 2019; Herden et al., 2021; Lobschat et al., 2021). The urgency of ethical issues in digital-driven business remains a crucial element of both organizational communication and managerial practice. In recent

years, society has demanded more transparency from companies about digital technology practices, oversight, and impacts. One sector that sharpens the view on these dynamics is information and communication technology (ICT).

One possible future highlighted by the ICT sector is a CSR landscape where digital technology sits beside

climate, workplace safety, and other mainstay topics. ICT firms are under pressure from advocacy groups and investors to improve their governance systems and performance with respect to a myriad of digital responsibility issues including—but not limited to—user privacy, freedom of expression, human and civil rights risks, ad targeting, and misinformation (see, respectively, World Benchmarking Alliance, 2022a, 2022b; Investor Alliance for Human Rights, 2018; Amazon, 2022; Ranking Digital Rights, 2022; Meta, 2022a, 2022b). Yet, despite the mounting influence of ICT companies in the global economy and society, the ways that they disclose core digital aspects of their business remain understudied. Corporate social responsibility (CSR) communication is a fruitful evidence base for this kind of examination (Allen & Craig, 2016), since the CSR concept has strongly influenced dialogue about the role of business in society over the past decades.

This paper explores how ICT companies scope their disclosure of digital topics in CSR communication. In particular, it looks at nonfinancial reporting whereby cybersecurity, data governance, privacy, and other digital issues have emerged in disclosures on sustainability; responsibility; and environmental, social, and governance (ESG) matters. Managerial and theoretical concerns arise from the fact that reporting practices are highly unstandardized, raising doubts about relevance for target audiences and fair representation of data, and sparking controversy over ethical issues. Further, in all sectors “greenwashing”—defined as deceptive communication about corporate sustainability performance on social, environmental, governance, or economic issues (Vollero, 2022, p. 2)—threatens to upend the reliability of disclosure. To combat greenwashing and to protect investors, regulators and legislators in multiple influential jurisdictions around the world are cracking down on CSR-related claims by companies and, furthermore, funds and investment advisers (Frangoul, 2022). The spread of digitalization amplifies these concerns for business by stoking new questions about the ways that companies communicate their responsible design and use of technology. Against this backdrop, the present study clarifies the practice of disclosure by ICT companies on digital issues in a rapidly evolving CSR terrain.

Through this analysis, the research makes two primary contributions to the CSR field. First, this study introduces for the first time an examination of the CSR discourse on digital issues among large ICT firms. Second, this study clarifies through signaling theory how ICT firms manage different approaches to materiality—“an iconic reporting concept associated with the fair representation of data” (Edgley et al., 2015, p. 1)—in their CSR reporting on digital topics. Signaling theory aids in analysis of how parties

with access to different information interpret communication about a quality that is otherwise imperceptible or unknown, which is defined as the materiality of digital issues for purposes of this study. Through these contributions, the work offers a basis for situating the ICT industry in a wider context of CSR communication.

Materiality and its conceptual links to greenwashing are key anchors in this study. In principle, materiality is a common standard that guides firms about what to disclose, but it is far from simple to implement. Materiality has been since the early 2000s a touchstone for scoping what to disclose in sustainability and ESG reporting (Garst et al., 2022). Its usage as a barometer of information relevance and usefulness is adapted from legal and professional definitions of materiality in corporate financial reporting and accounting. Yet materiality has been a murky concept since its inception (Brennan & Gray, 2005), and the sustainability and ESG movements have multiplied its meanings. Lack of a common materiality definition leaves room for managerial discretion about the line between material topics that are reported and immaterial topics that are not (Garst et al., 2022).

Thus, this paper begins to unpack meanings of materiality in the ICT industry by asking the following question: how do firms identify digital issues as material in their CSR communication? It examines nonfinancial disclosures in CSR communication of 40 large ICT companies (annual revenue > \$44 billion). In doing so, it illuminates social pressures that constrain ICT companies’ reporting and, at the same time, it shows how ICT companies use their power to meet disclosure expectations with a degree of freedom that needs to be managed carefully.

The paper is organized as follows. First, it defines bounds of CSR communication and traces a history of the emergence of digital issues in CSR media from about 2010. Second, it integrates literature on the development of social meanings of materiality, greenwashing, and signaling theory. Then it describes the research approach, analysis, and results. Next, it discusses study implications for the intersection between current communication practices in the ICT industry and greenwashing, followed by recommendations for managers and contributions to signaling theory.

Background

Key concept defined: CSR communication

CSR communication is a familiar term in business, civil society, academia, and the public sector, and scholarly exploration of the ties between CSR and communication have produced a distinct subfield of CSR communication research (Schoeneborn et al., 2020). In recent years, scholars and organizations have examined CSR from two contrasting perspectives (Dhanesh, 2015). Some, such

as the World Business Council for Sustainable Development, see CSR as a means for businesses to commit to economic development while at the same time improving quality of life for workforces, local communities, and society more broadly (e.g., Brei & Böhm, 2013). The second perspective sees CSR as a strategic anchor tying an organization's financial performance to its stakeholder management (e.g., Adomako & Tran, 2022). Given these distinct orientations to CSR, a subliterature on CSR communication integrates a number of scholarly approaches and themes, as multiple reviews have found (Du et al., 2010; Crane & Glozer, 2016; Ellerup Nielsen & Thomsen, 2018; Verk et al., 2021). There are targeted views of CSR communication in terms of public relations, marketing, public affairs, or management (see Podnar, 2008; Coombs & Holladay, 2011). Other approaches, such as that of Allen and Craig (2016, p. 3), focus on how organizations and their stakeholders use CSR communication to build responsiveness on ethical issues and practices, corporate philanthropy, and corporate citizenship. In this paper I primarily rely on the latter approach, centered on responsiveness and ethical issues.

CSR communication has become an umbrella term for the production, consumption, and exchange of related but distinguishable kinds of information which are known as CSR, nonfinancial, ESG, and sustainability information (O'Connor, 2022). This liberal sense of CSR communication is deployed in this paper to capture a broad range of discursive phenomena, though the intention is not to conflate different kinds of information. This is because there is some conditioning that leads researchers and practitioners to use concepts interchangeably—such as CSR and sustainability, as Verk et al., (2021, p. 510) pointed out—without explaining how the concepts intersect. CSR is an important component of nonfinancial information, which is variously published by organizations in reports having different names, although they may share traits and media, such as CSR, ESG, sustainability, and corporate responsibility reports (Stolowy & Paugam, 2018). Companies seeking to explain their CSR must identify their instrument of accountability (Adams, 2008), and they have developed multiple forms of media to meet this need.

Digital issues emerge in CSR communication, 2010–23

Though scholars have examined the ICT sector's CSR media generally (Micek & Aydin, 2017; Abukari & Abdul-Hamid, 2018; Ervits, 2021), the presentation of digital issues specifically in this communication has received little attention in CSR research until very recently (Bonsón et al., 2023). A patchwork history underlies the phenomenon and suggests why it has largely eluded scholarly analysis.

The rise of digital topics in CSR communication may be traced to a kind of corporate disclosure that was at first specific to ICT companies: transparency reporting (Micek & Aydin, 2017). In 2010, Google published a report on government requests for content takedowns and disruption of its services internationally, inaugurating an era of transparency reporting that companies have since expanded to include information about third-party requests for user data, traffic disruptions, content restriction, and other policies and practices that impact privacy and freedom of expression online.

Since then, there have been increasing calls from “norm entrepreneurs”—actors who shape norm development (see Radu et al., 2021)—for corporate self-reporting on digital issues. Major NGOs (nongovernmental organizations) active in the space include Electronic Frontier Foundation, World Benchmarking Alliance, Global Network Initiative, Access Now, and New America and its initiative, Ranking Digital Rights. A coalition of advocacy organizations, academic experts, and private sector firms developed a set of guidelines, known as the Santa Clara Principles, for operationalizing transparency and accountability for internet platform firms, specifically with regard to moderation of user-generated content. Regulators and government-appointed working groups have studied evolving norms in digital issue disclosure, including CSR communication, with an eye toward mandatory reporting regimes (see United Kingdom Ministry for Digital, Culture, Media & Sport, 2020; European Financial Reporting Advisory Group, 2022). Scholars and advocates with expertise in business ethics, policy, and CSR have suggested that companies could expand their disclosures on cybersecurity, privacy, and data practices (e.g., Toker, 2013; Woolery et al., 2016; Shackelford, 2020, p. 63; Bloemendal, 2021). Global standard-setters, notably the Global Reporting Initiative (GRI) and Sustainability Accounting Standards Board (Sustainability Accounting Standards Board, 2022), have responded to some of these calls for change. Figure 1 provides a timeline that illustrates core elements of this history and conveys how ad hoc and contingent it is.

Theory has followed practice in the sense that the academic literature began to conceptualize “corporate digital responsibility” around 2020–21 (Liyanaarachchi et al., 2020; Herden et al., 2021; Lobschat et al., 2021), a decade after the original transparency reports by ICT companies began to appear. Bednárová and Serpeninova (2023)'s bibliometric analysis of the literature on corporate digital responsibility (known as CDR) described Italian energy and utilities holding company Hera Group as a pioneer of the concept, having defined it in its 2021 sustainability report as “a set of practices and behaviors that help an organization to use data and digital technologies in

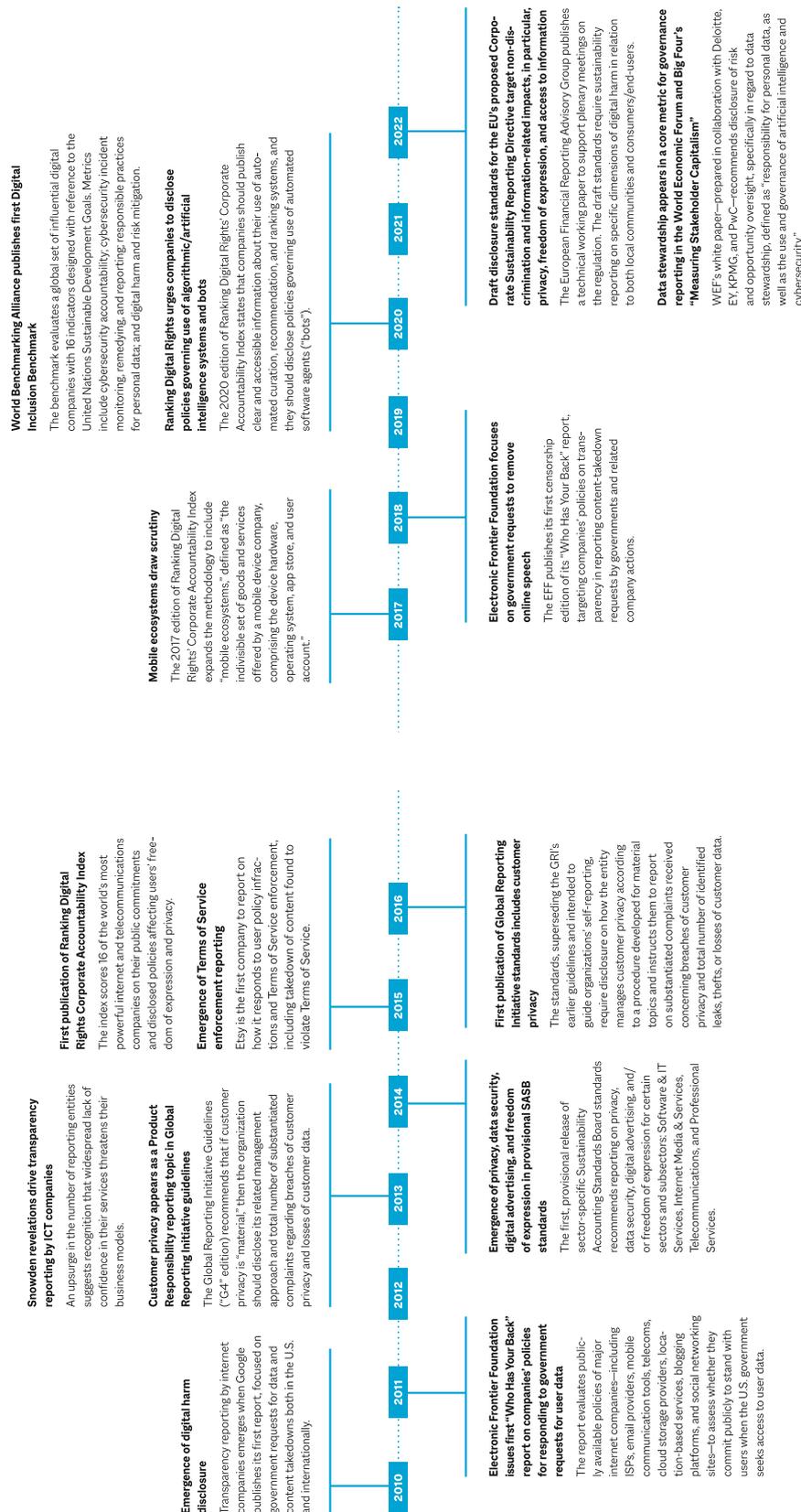


Fig. 1 Development of norms for digital issue reporting in CSR communication

an ethical and responsible way in social, environmental, economic, and technological dimensions” (Hera Group, 2021, p. 128). As Bonsón et al., (2023, p. 3) point out, recent academic and industry sources consider CDR to be a new layer of CSR, which now encompasses responsibilities brought by the digital revolution in the business sector, including novel forms of disclosure.

While digital issue reporting has become a more prominent part of CSR norms and broken into the academic literature, the concept of materiality has undergone change in the wake of sustainability and ESG movements. This complicates our understanding of why and how ICT firms choose certain issues to prioritize and describe in CSR media. A growing body of research suggests that nonfinancial accounting, in both theory and practice, shapes the disclosure of digital topics.

Materiality arises in nonfinancial accounting and takes on new social meanings

Interdisciplinary research has observed that the concept of “materiality” in corporate reporting has undergone significant change since the early 2000s, particularly with the rise of nonfinancial accounting (Calace, 2019). Traditionally, materiality served as a principle in financial accounting, auditing, and financial disclosures law and regulation (Terrell, 2021). Publicly traded companies face difficult disclosure choices throughout the fiscal year, and their obligation to report turns on the concept of materiality, although its definition is the subject of debate, conflicting case law, and increasing regulatory attention in the U.S., E.U., Asia, and elsewhere (Schulzke & Berger-Walliser, 2017; McCauley and Wincuin, n.d.). In general, “material” information ought to be disclosed if a user of financial statements would attach importance to it.

But usage of the term “materiality” since 2000 is nonuniform across finance, accounting, investing, and CSR initiatives. What has become elusive with the rise of sustainable finance, ESG, and related investment philosophies and norms is whether an investor’s interest is solely a financial return and how narrowly that interest is bounded (Katz & McIntosh, 2021; Roisman, 2021). Nonfinancial accounting has developed to represent, measure, and contextualize information that lies beyond traditional financial bounds, having no direct monetary aspect yet perceived to be of interest to firms’ internal and external stakeholders (Cooper & Owen, 2007). Materiality is thus no longer exclusively associated with financial concerns but applies to all capitals (economic, natural, social, human, etc.).

Materiality is the conceptual root of nonfinancial accounting approaches and is supposed to guide companies to decide which parts of their business should be covered in this accounting, yet there is no one consensus

definition of materiality (Calace, 2019; Raith, 2023). There are relatively new corporate functions—sustainability and ESG—that perform monitoring missions in concert with internal controls, compliance, and financial accounting. But while the latter operate under a rules-based framework defined in mandatory terms by external institutions, sustainability and ESG largely represent companies’ self-governance (Gadinis & Miazad, 2020, p. 1415). All sustainability and ESG standard-setters emphasize that firms should cover only the topics that are “material” to them, giving companies discretion to use their own method to determine material topics (Garst et al., 2022). This procedure, carried out by a company’s ESG or sustainability function, often involves a “materiality assessment” that gathers and prioritizes input from internal and external stakeholders (Torelli et al., 2020). These institutional factors cede leeway to businesses to shape the interplay between nonfinancial accounting practices and material issues.

Unsurprisingly, materiality has taken on new social meanings and stands for a flexible set of concepts rather than a fixed scheme. There exist novel concepts of materiality in social and environmental reporting (Edgley et al., 2015) such as ESG materiality (Jebe, 2019), nonfinancial materiality (Cisi et al., 2022), and double materiality (Baumüller & Sopp, 2022; Delgado-Ceballos et al., 2023), which reflect different concerns about scope and audience for nonfinancial information. There’s little expectation that regulation by governments will unify materiality’s definition. Rather, the outgrowth of materiality concepts, which may overlap and conflict (Brennan & Gray, 2005), reflect their social construction across time and domains (Calace, 2019; Bolt & Tregidga, 2023). Bounded studies, by taking specific institutional or social processes into account, prove a useful lens for bringing materiality into focus (Jebe, 2019).

Materiality drives change in CSR communication

The maturation of nonfinancial accounting has had ripple effects in CSR communication. Results of nonfinancial accounting are presented in CSR media such as corporate responsibility reports, ESG reports, sustainability reports, and transparency reports (Stolowy & Paugam, 2018). In some cases they are appended to financial and other information in annual reports or integrated reports. Channels for disseminating these documents are found in various areas of company websites, including investor relations, CSR, ESG, and sustainability pages. Thus, the media that share nonfinancial accounting take many forms, arguably more so than financial accounting.

Audience expansion is also linked to shifts in approaches to materiality and nonfinancial accounting. As strategic management has embraced multistakeholder

models—thereby challenging shareholder primacy—the practices of accounting and reporting have adapted to new types of information consumers (Parmar et al., 2010). While firms frame CSR communication in different outputs from the annual report (Cerin, 2002) to nonfinancial reporting (Hooghiemstra, 2000; Chatterji & Levine, 2006) to web pages (Coupland, 2005; Guimaraes-Costa & Cunha, 2008), none has a static set of readers. Audiences of CSR communication have widened in approximate tandem with the relevance of materiality, which has grown beyond the conventional association with readers of financial statements. *Material for whom* has become a disputed question with multiple answers, since various stakeholders—not just investors—read nonfinancial disclosures in CSR, ESG, sustainability, and annual reports (Reimsbach et al., 2020). Analysis of firm disclosures must therefore consider the heterogeneity of the readership they are seeking to address.

In practice, stakeholder orientation has led to a shift in agency, where determinations of materiality may be in the hands of reporting teams in firms who are different professionals than those auditors and accountants who have trained in traditional principles of materiality and who are constrained by related regulations (Calace, 2019, p. 492). These professionals, who sit for example in CSR, ESG, and sustainability groups, have not yet had to comply with mandatory rules set by trade organizations, nor do they have a mature body of laws to govern nonfinancial reporting. To identify which issues are material in CSR reporting, these professionals may run analyses using methodologies of each firm's choosing, which may include gathering information from internal and external stakeholders such as employees, directors, officers, NGOs, academics, business partners, customers, and governments (Herremans et al., 2016; Kaur & Lodhia, 2018; Bellucci et al., 2019; Safari & Areeb, 2020).

Materiality concepts have complicated nonfinancial reporting in both its voluntary and mandatory forms. Whereas standard-setters and NGOs apply “soft” pressure by issuing non-binding guidance, there are mandatory reporting regimes for nonfinancial disclosure that firms must take into account. Globally, a growing number of legislation initiatives define obligations for companies to produce recurrent reporting on key ESG and sustainability issues (Principles for Responsible Investment, n.d.). In sum, a patchwork of hard and soft law pressures firms to navigate regulations, guidance, and charters issued by different authorities including governments, stock exchanges, standard-setters, and civil society organizations.

Materiality presses companies to craft a flexible approach if they have reporting obligations to, or need to align with, more than one institution. In a common

scenario, public ICT firms must report to the U.S. Securities and Exchange Commission (SEC) using one materiality paradigm set out in the relevant regulations and caselaw, while at the same time their CSR communications may cater to emerging materiality paradigms being shaped by norm entrepreneurs in the sustainability and ESG reporting landscape. In all likelihood, companies will need to become even more agile, particularly as the SEC announced a Climate and ESG Task Force to identify ESG-related misconduct (U.S. Securities and Exchange Commission, 2021), and furthermore recently adopted new rules to standardize cybersecurity risk management, strategy, governance, and incident disclosure (U.S. Securities and Exchange Commission, 2023).

Materiality and the problem of greenwashing

Materiality is closely intertwined with how nonfinancial reports are made, but it also affects how the communication is received. A body of research on greenwashing (Gatti et al., 2019) has examined the extent to which reporting is perceived as deceptive or overly selective by using empirical studies (e.g., Ramus & Montiel, 2005; Kim & Lyon, 2011; Mahoney et al., 2013) and normative approaches (e.g., Laufer, 2003; Bowen & Aragon-Correa, 2014). Early work characterized greenwashing as the making of claims that are trivial, misleading, or deceptive (Kangun et al., 1991). Scholars have since widened the view of greenwashing to include selective disclosure of positive information without full disclosure of negative information (Lyon & Maxwell, 2011). Though the coining of the term “greenwashing” was by an environmental activist (in an essay criticizing hotels for placing a “green card” in each room to promote reuse of towels to “save our planet”; see Vollero, 2022, p. 7), the concept has enlarged to include social and economic issues (Munshi & Kurian, 2005; Bazillier & Vauday, 2009; Lyon & Maxwell, 2011; Pope & Wæraas, 2016; Siano et al., 2017). These scholarly shifts have expanded the lens to look at the reception of different reporting practices in a growing number of sectors, but little attention has been paid to ICT firms' claims about digital issues.

Some industry-specific studies find materiality to be a central contested concept on which perceptions of greenwashing may turn (Hummel & Festl-Pell, 2015; Khalil & O'Sullivan, 2017; Zharfpeykan, 2021). For example, scholars examining the global apparel industry found a discrepancy between two different approaches to prioritizing material issues—expert consultations and companies' materiality assessments—where the latter involved overestimation of good environmental performance (Ferrero-Ferrero et al., 2021). Studies in business ethics have questioned the objectivity of firms' processes

for defining material issues from a stakeholder-centric perspective (Hess, 2007; Dubbink et al., 2008; Boiral & Henri, 2017; Guix et al., 2019; Beske et al., 2020). Others have observed complicated dynamics whereby external institutional pressure contributes to perceived greenwashing outcomes. For example, Hummel and Festl-Pell (2015) concluded that a pattern of overstating immaterial disclosure areas suggests the existence of greenwashing but also reflects an inherent conflict with firms' attempts to adhere to standard-setter guidelines. However, it is relatively unknown how materiality might play a role in perceptions of greenwashing vis-à-vis ICT companies' disclosures.

Signaling theory is a widely deployed framework for corporate legitimacy and CSR issues, though its use to aid understanding of greenwashing is so far largely limited to environmental reporting contexts (Zhang et al., 2022). Signaling theory aids in analysis and understanding of information asymmetry, that is, how two parties with access to different information interpret received signals (Connelly et al., 2011, pp. 40–45). The role of signaler is assumed by the company (even when specific messages are created by or attributed to an individual person in the firm), and the signal is a communication that the company gives about a quality that is otherwise imperceptible or unknown (Galli et al., 2021, p. 5), such as its level of CSR or the materiality of a particular issue. Signaling theory has so far concentrated primarily on intentional communication of positive information in order to convey positive organizational attributes, but extensions of the approach examine negative signals, which potentially communicate adverse information about the signaler or pose conflicts with intentionally positive signals (Connelly et al., 2011, pp. 44–45). Through signaling theory, empirical study examines such negative signals, what makes them distinct, or how they disturb or advance the signaling process (Bell et al., 2008; Fischer & Reuber, 2007). Intentionality is not necessary for negative signals because companies may send a wide range of signals without being aware of them (Connelly et al., 2011). Greenwashing, then, can be understood as deceptive communication that produces negative signals about a firm's CSR, irrespective of intent.

With the above literature streams in mind, the present work takes stock of social meanings of materiality in the ICT industry's CSR communication with three research questions:

RQ1

Which digital issues do ICT companies identify as material in nonfinancial reporting?

RQ2

Which institutions do ICT companies explicitly name as guides for their nonfinancial reporting on digital issues?

RQ3

Do ICT companies produce negative signals in their communication of materiality for digital issues? If so, how?

Approach

This paper builds on studies in CSR, communication, business ethics, accounting, and management to uncover CSR practices in the ICT industry that trade on meanings of materiality. Observing the evolution of materiality concepts and practices, accounting research suggested that materiality is a sociobehavioral rather than a technical phenomenon (Carpenter & Dirsmith, 1992; Carpenter et al., 1994; Edgley et al., 2015). So, although materiality arises from the premise of relevance, scholars have suggested that the definition of relevance is socially constructed through performance of some activity, such as accounting (Edgley, 2014; Edgley et al., 2015). In this sense, to understand materiality, one ought to comprehend how people seek to define and distinguish it, rather than presume a fixed formula that applies across contexts (Calace, 2019, p. 491). Deciding between material and immaterial information is an outcome of organizational process, professional judgment, and evidence-gathering, not application of a mechanical rule.

The research approach involved critical evaluation of how ICT companies use the concept of materiality as a signaling device in their CSR communication. To achieve this, I performed a qualitative discourse analysis of 40 ICT companies' CSR reports. Table 1 provides a list of the corporations and CSR reports. Companies were selected for analysis if they were in the top 40 ICT companies by annual revenue in the 2022 Fortune Global 500 and produced a CSR report in English.¹ This selection method generated a set of 23 technology companies, 15 telecommunications companies, and two internet services and retailing companies. A driving assumption in this research, therefore, is that ICT companies in the Fortune Global 500 are subject to high CSR scrutiny relative to other firms in the sector, and it follows that their CSR reporting on digital topics would represent a leading edge.

Due to the mostly voluntary nature of CSR disclosure, the names and forms of reports vary: for this study, the corpus of evidence includes sustainability reports, ESG reports, corporate responsibility reports, integrated

¹ As a result, the study excludes China Electronics Corporation (Fortune Global 500 ranking #233), for which a CSR report in English could not be found. In its place, the study includes Compal Electronics (Fortune Global 500 ranking #317).

Table 1 Corpus of CSR communication by 40 ICT firms in Fortune Global 500^a

Firm	Source(s) analyzed	
Accenture	2022 360° Value Report	Accenture, 2022
Alibaba	2018 ESG Report 2021 Sustainability Report for Alibaba Cloud	Alibaba, 2018 Alibaba Cloud, 2021
Alphabet	Investor Relations Sustainability & Related Information, https://abc.xyz/investor/other/sustainability-and-related-information/	Alphabet, n.d.
Amazon	2020 Sustainability Report	Amazon, 2021
América Móvil	2021 Sustainability Report	América Móvil, 2021
Apple	2022 ESG Report March 2022 ESG Index	Apple, 2022a Apple, 2022b
AT&T	March 2022 ESG Summary Social Responsibility Report Library & Archive, https://about.att.com/csr/home/reporting/library.html	AT&T, 2022 AT&T, n.d.b
Charter Communications	2022 Environmental, Social and Governance Report	Charter Communications, 2022
China Mobile Communications	2022 Sustainability Report	China Mobile Communications, 2022
China Telecommunications	2021 Corporate Social Responsibility Report	China Telecommunications, 2021
China United Network Communications (China Unicom) ^b	2021 Sustainability Report	China Unicom (Hong Kong) Limited, 2021 China Mobile Communications, 2022
Cisco Systems	2022 Cisco Purpose Report, Cisco ESG Reporting Hub, https://www.cisco.com/c/m/en_us/about/csr/esg-hub.html	Cisco, 2022 Cisco, n.d.
Comcast	2022 Impact Report June 2022 SASB Report	Comcast, 2022a Comcast, 2022b
Compal Electronics	2021 Sustainability Report	Compal Electronics, 2021
Dell	FY2022 Environmental, Social and Governance Report	Dell, 2022
Deutsche Telekom AG	2021 Corporate Responsibility Report & addenda	Deutsch Telekom, 2021
Hitachi	2022 Sustainability Report	Hitachi, 2022
Hon Hai Technology Group	2021 Sustainability Report	Hon Hai Technology Group, 2021
HP	2021 Sustainable Impact Report	HP, 2021
Huawei	2021 Sustainability Report	Huawei, 2021
IBM	2022 Environmental, Social and Governance Report 2021 GRI Index 2021 SASB Index	IBM, 2022 IBM, 2021a IBM, 2021b
Intel	2021–22 Corporate Responsibility Report	Intel, 2022
KDDI	2022 Integrated Sustainability and Financial Report Sustainability site, https://www.kddi.com/english/corporate/sustainability/	KDDI, 2022 KDDI, n.d.
Lenovo	2021–22 ESG Report	Lenovo, 2022
LG Electronics	2021–22 Sustainability Report 2021–22 ESG Fact Book	LG Electronics 2022b LG Electronics, 2022a
Meta	2021 Sustainability Report ESG Resources hub, https://investor.fb.com/esg-resources	Meta, 2022a Meta, n.d.
Microsoft	Corporate Social Responsibility Reports Hub, https://www.microsoft.com/en-us/corporate-responsibility/reports-hub	Microsoft, n.d.
NTT	2022 Sustainability Report	NTT, 2022
Orange	2021 Integrated Annual Report	Orange, n.d.
Panasonic	2022 Sustainability Data Book	Panasonic, 2022
Pegatron	2021 Sustainability Report	Pegatron, 2021
Samsung	2021 Sustainability Report	Samsung Electronics, 2021
SoftBank Group	2022 ESG Data Book Sustainability site, https://www.softbank.jp/en/corp/sustainability/	SoftBank Group, 2022 Softbank Group, n.d.
Sony	2022 Sustainability Report	Sony, 2022

Table 1 (continued)

Firm	Source(s) analyzed	
Taiwan Semiconductor	2021 Sustainability Report	Taiwan Semiconductor, 2021
Telefónica	2021 Consolidated Management Report 2020 Consolidated Management Report	Telefónica, n.d.b Telefónica, n.d.a
Tencent	2021 ESG Report	Tencent, n.d.
Verizon	2021 ESG Report ESG Resources Hub, https://www.verizon.com/about/investors/esg-resources-hub	Verizon, 2021 Verizon, n.d.
Vodafone	2022 Annual Report ESG hub, https://investors.vodafone.com/esg	Vodafone Group plc, 2022 Vodafone Group plc, n.d.
Xiaomi	2021 Environmental, Social and Governance Report	

reports, consolidated management reports, purpose reports, impact reports, annual reports, issue briefs, and web sites. Because firms publish on discretionary schedules independently of one another, there is some variation in dates of the reports in this analysis (conducted May–October 2022 and April 2023). Some firms' CSR communications for 2022 were the most recent available, whereas for others the most recent year available was 2018, 2020, or 2021.

The foundational parts of this study use organizational discourse analysis as framework (Hardy, 2001),² positing that texts are a form of social action, a source of evidence about social relations, and a barometer of ongoing social processes (Fairclough, 1995). Companies that publish CSR reports are seen not as isolated producers of information but as sites of multidirectional struggle where different voices from inside and outside the firm shape the social reality of the organization (Mumby & Clair, 1997, p. 182) and its rhetoric (O'Connor & Shumate, 2010; Pedersen et al., 2013). As this paper will show, external institutions constrain the use of materiality concepts in ICT firms' CSR reporting, while at the same time the companies demonstrate a degree of freedom in how they choose to define, contextualize, and validate materiality. Discourse analysis uncovers the communications by which "texts are the sites of the emergence of complexes of social meanings ... that record in partial ways the histories of both the participants in the production of the text and of the institutions that are 'invoked' or brought into play" (Kress, 1995, p. 122).

To connect the analysis to managerial strategy regarding greenwashing, this research uses signaling theory to highlight negative signals in ICT firms' presentation of digital issues' materiality. Building on earlier studies that identify negative signals and how they perturb a signaling process (Bell et al., 2008; Fischer & Reuber, 2007), this

paper examines ambiguities in CSR media that amplify—rather than reduce—asymmetry between the reporting organizations and their audience. Both verbal and visual ambiguity, which are found in text and graphics in CSR reports, are in the analytical scope.

One normative view of CSR transparency is that it is an instrumental good, helping bring accountability to corporations' decisions that have profound impacts on society and public discourse. But this view is contested (Pozen, 2020), and it also unnecessary for the argument in this paper. The fact is that ICT firms have developed signals for CSR that embed a nascent transparency regime for the actions they take and the policies they create to manage interdependency between ICT systems and societal well-being. This specific signaling system is poorly understood and may have underappreciated upstream and downstream effects, such as enablers and consequences of greenwashing, that rigorous research may unlock. This paper examines the signals as phenomena worthy of study, in order to generate managerial implications for navigating the challenges of greenwashing.

Analysis and interpretation

The investigator manually coded the CSR documents in four phases. In the first phase of analysis I located each firm's use of the materiality concept and analyzed the basis given by each firm for its use. This involved studying definitions and institutional sources cited in the text, descriptions of materiality assessments conducted by the companies, and diagrams showing the results of such assessments. From this close reading, I created a preliminary set of codes. In the second phase of analysis, the data were reviewed with particular attention paid to how the corporation explained and framed the links between materiality and digital issues. At this stage I generated a list of digital-related issues identified as material or significant by each firm and added new codes focused on each firm's issue management.

² My discourse analysis in this essay is just one possible reading of a complex body of sources.

Negative instances that failed to fit within the initial analytical constructs were used to expand or amend the codes. In the third phase, I reviewed the evidence again to examine institutional constraints cited in the texts. In the fourth phase, I examined verbal and visual ambiguities in each firm’s presentation of significant and material digital issues in CSR communication. These ambiguities are posited as potential negative signals in the interpretation stage.

Results

The research questions guiding this study facilitate an understanding of how large ICT firms define and defend the materiality of digital issues in their business, and how this signaling takes shape between the companies’ discretion and constraints external to them.

Identification of material digital issues

The first research inquiry identified digital issues that ICT companies designate as material in CSR communication. On average, corporations in this study reported 4.44 digital issues as material. Table 2 presents the top 14 issues by frequency.

A caveat is that these issues are loose categories, not necessarily having the same meaning across reports. There is no standard technical language that firms use to disambiguate what they mean by “digital inclusion,” “responsible marketing,” and other such value-laden terms. In fact, the top two material issues by a wide margin—data protection (or privacy) and cybersecurity—have no universal definition.

Value systems are thus an important backdrop against which to understand material issues in ICT firms’ CSR communication. The values that CSR, ESG, and sustainability promote neither derive from a moralistic philosophy of “doing the right thing,” nor are they dictated by a central standard-setter (Gadinis & Miazad, 2020, p. 1426). Rather, they arise from the companies’ own processes for identifying material issues, which may include consulting internal and external stakeholders for information, which in turn is interpreted, prioritized, and described in a bespoke way by teams of professionals who may change across companies and across time. This social context must be taken into account when reviewing the results in Table 2. For instance, four companies identified “responsible AI,” “ethical AI,” or “AI ethics” as material,³ which are necessarily company-specific terms, since there are no settled understandings of what they mean at global or local levels.

It is worth pausing here to remark on the notable impact of regulatory context, which helps clarify the meanings of materiality that are in play when companies disclose digital issues such as those in Table 2. American firms tended to make explicit distinctions between materiality for purposes of voluntary CSR reporting and materiality as defined under U.S. securities law. Disclaimers in the CSR reports were observed as a strategy for doing so. For example, Microsoft’s description of its reporting governance and approach, which is found in the company’s CSR Reports Hub, states that “Our reporting describes those topics which we consider to be the most important to stakeholders when evaluating environmental, social, and governance (ESG) issues at Microsoft. Therefore, ESG materiality in our reporting does not directly correspond to the concept of materiality used in securities law.” (Microsoft, n.d. “Reporting governance and approach”). Another corporate tactic is to draw a line between materiality assessment for purposes of CSR reporting and materiality determination for purposes of securities law. Amazon exemplifies this approach in its Sustainability Report, stating first that “We [...] conduct regular materiality assessments to understand the most significant environmental, social, and governance topics across our business over the short, medium, and long term” and in another context that “Inclusion of information in this report is not an indication that the subject or information is material to Amazon’s business or operating results” (Amazon, 2021, pp. 104, 137).

Besides distinguishing “ESG materiality” and “materiality assessment” from the concept of materiality in U.S. securities law, other American firms took a

Table 2 Top material issues cited by 40 ICT firms, 2018–22

Material issue	Number of firms citing the issue
Data protection or privacy	29
Cybersecurity (includes data, information, product, and network security)	29
Human rights or digital rights	19
Digital inclusion or digital divide	13
Technology innovation or disruptive technologies	11
Responsible use or responsible products ^a	8
Accessibility	6
Network reliability, disruptions or IT failures	5
Advertising standards or responsible marketing	4
Digital skills, digital literacy, or media literacy	4
Network expansion or performance	4
Intellectual property protection	3
Content integrity or governance	3
Online safety or protection of minors	2

^a Includes responsible AI, ethical AI, and AI ethics

³ Intel, Microsoft, Samsung, Sony.

slightly different tack to avoid statements that could be perceived as misleading from a securities law perspective. At the same time, they attempt to align with third-party standard-setters, such as the Global Reporting Initiative (GRI), that prescribe ESG or sustainability reporting on material issues where the meaning of “material” is constructed outside the context of the U.S. legal system. In these cases, the companies identified certain issues as significant — using language other than “material” such as “impactful” or “high-priority impactful” (Verizon, 2021, p. 6) — and mapped them onto third-party voluntary frameworks that call for disclosures on material topics. These mappings include material risk factors identified on the company’s Form 10-K filed with the SEC, which a company employs to satisfy the list of material issues disclosed with the Global Reporting Initiative’s voluntary model (e.g., Apple, 2022a, 2022b, *ESG index* p. 7). Because these mappings effectively characterize specific topics as material, they are included in the calculations that underlie Table 2.

Beyond the 14 core digital issues presented in Table 2, additional digital topics were cited as material by ICT firms in the documents examined for this study, but these were singular mentions not matched in similar terms by other firms. Therefore, they are absent from the table.

External institutional constraints

To illuminate constraints on CSR reporting imposed by institutions outside the ICT industry, the second research inquiry examined which of these institutions receive mention in firms’ CSR reports as having an influence on the information reported. Table 3 summarizes the results, enabling us to grasp the number and kinds of organizations that shape reporting norms for the ICT industry.

The research observed mentions of the following organizations in the CSR reports (see Table 1 for sources).

Global Reporting Initiative (GRI)

- GRI is an independent, global standard-setter that develops Sustainability Reporting Standards (Global Reporting Initiative, 2022a).

Sustainability Accounting Standards Board (SASB)

- SASB was an independent, global standard-setter that developed sustainability accounting standards; the organization was consolidated into the International Financial Reporting Standards Foundation in 2022 following a merger with the Value Report-

ing Foundation, though afterward the SASB Standards remain a reporting framework (Sustainability Accounting Standards Board, 2022).

United Nations Sustainable Development Goals (UN SDGs)

- The SDGs are a call to action in the 2030 Agenda for Sustainable Development adopted by all United Nations member states in 2015 (United Nations Department of Economic and Social Affairs, n.d.).

UN Global Compact (UN GC)

- The GC is a public-private, voluntary initiative based on CEO commitments to support UN goals and implement universal sustainability principles on human rights, labor, environment, and anti-corruption (United Nations Global Compact, n.d.).

UN Guiding Principles on Business and Human Rights (UNGPs)

- The UNGPs is a set of guidelines for companies and states to prevent, address, and remedy human rights abuses committed in business operations (United Nations Human Rights Office of the High Commissioner, 2011).

Stock exchanges

- Stock exchanges and related trade associations coordinate ESG disclosure guidance for listed companies.

Ratings and research providers

- For-profit ESG and sustainability ratings providers are information intermediaries that publish scores, indices, and associated methodologies.

World Benchmarking Alliance (WBA)

- WBA is a global NGO that publishes benchmarks that compare companies’ performance on the UN SDGs (World Benchmarking Alliance, n.d.).

World Economic Forum (WEF)

- WEF is a global non-profit whose Measuring Stakeholder Capitalism initiative attempts to accelerate public-private collaboration toward a global solution for nonfinancial reporting (World Economic Forum, 2022).

Table 3 Organizations cited as influences by ICT firms in CSR communication

Firm	SASB	GRI	UN SDGs	UN GC	UN GPs	Stock exchanges	Ratings & research providers	WBA	WEF
Accenture
Alibaba									
Alphabet	.								
Amazon	.								
América Móvil	.	.							
Apple	
AT&T					
Charter Communications	.								
China Mobile Communications				
China Telecommunications		.	.			.			
China Unicom ^a		.		.		.			
Cisco Systems		
Comcast	.								
Compal Electronics
Dell
Deutsche Telekom AG					
Hitachi
Hon Hai Technology Group
HP
Huawei					
IBM					.				
Intel		
KDDI			
Lenovo				
LG Electronics		
Meta					
Microsoft				
NTT	
Orange			.	.					
Panasonic				
Pegatron				
Samsung
SoftBank Group	.								
Sony
Taiwan Semiconductor
Telefónica	
Tencent			
Verizon				
Vodafone					
Xiaomi		

SASB Sustainability Accounting Standards Board, GRI Global Reporting Initiative, UN SDGs United Nations Sustainable Development Goals, UN GC United Nations Global Compact, UN GPs United Nations Guiding Principles on Business and Human Rights, WBA World Benchmarking Alliance, WEF World Economic Forum

^a China Unicom (Hong Kong) Limited only

ICT companies, by citing names of institutions that influence their CSR reporting, are working to establish a long-term position in a fluctuating political and cultural terrain. A common approach is to

emphasize the non-binding or “soft” character of guidance documents produced by standard-setters and NGOs. For example, in HP, (2021, p. 92) the company states that,

[t]o determine report contents, we consider ... [e]xternal standards and frameworks such as the Global Reporting Initiative Sustainability Reporting Standards, the UN Global Compact, the UN Sustainable Development Goals, the Sustainability Accounting Standards Board Hardware Sustainability Accounting Standard, the Task Force on Climate-Related Financial Disclosures, and the World Economic Forum International Business Council Stakeholder Capitalism Metrics.

Statements like this effectively emphasize the company's leeway to craft its own approach to materiality.

Negative signals in determining, visualizing, and defending material digital issues

The third research question asked whether negative signals arise in ICT companies' presentation of material digital issues, and if so, how. Analysis of ICT firms' CSR communications listed in Table 1 identified three key categories of negative signal. Their presence came into play when the communications identify, visualize, or defend material digital issues.

Vague approaches to determining and visualizing material issues

Corporations in this study described their process for identifying material issues, commonly known as a materiality assessment, in terms of broad approach but not specific methodology. In effect, this prevents external validation of the results. To see why this is the case, recall that new forms of materiality in CSR communication have multistakeholder reference points beyond that of an investor interested in monetary return. Therefore, traditional financial accounting and audit methods do not apply.

In general, a collaborative process between a firm and its external stakeholders will contribute to materiality assessment, particularly for those companies that follow the GRI's model (Global Reporting Initiative, 2022b, p. 103). With the input of various groups such as advocacy organizations, academics, and customers, companies are responsible for leading and managing the engagement. The outcome in practice is that corporate reporters themselves decide the material issues, since they run the materiality assessment and have no obligations to disclose their methods or raw data (Ortar, 2020, p. 114). For instance, because their methodology remains vague, one might reasonably assume that at least some external stakeholders represented in the discussions were chosen by the firm because of low potential for conflict.

ICT firms take advantage of lax norms for materiality assessment reporting. A common signaling strategy is

to use a pseudo-statistical vocabulary to convey qualitative information, lending a mathematical air to information that is essentially subjective. AT&T exemplifies this on the webpage for its ESG Material Issues Assessment, describing the company's approach as follows:

Every 2–3 years, we systematically engage a broad sampling of internal and external stakeholders to identify and prioritize the most significant ESG impacts, risks, and opportunities our company should address. ... [W]e distributed electronic surveys to individuals across 8 internal and external global stakeholder groups. ... Findings from the assessment were analyzed using a quantitative scoring system, plotting the 29 ESG topics on a matrix. (AT&T, n.d.a, ESG Material Issues Assessment)

Next to this explanation, the matrix is presented as a graph with two axes but no numbers (Fig. 2). Though the statement refers to "sampling," "plotting," and a "quantitative scoring system," there are no statistical parameters provided that would allow examination of the data, methods, or results.

Visual graphics, like text, may be company signals. Analytical diagrams, representing results of a company's materiality assessment, visualize value-laden concepts in the organization's decision-making (Höllerer et al., 2019).

Faced with AT&T's materiality matrix, no reader can verify the company's inputs or logic, an outcome that is somewhat at odds with the scientific look of graphs that AT&T and other firms publish to convey their materiality assessments visually. It's unclear, for instance, who among AT&T's internal and external stakeholders are represented by each axis. Samsung provides another example (Fig. 3) in its 2021 Sustainability Report, showcasing a common format: two perpendicular axes with a pseudo-scatterplot designating the positions of different material issues. Ortar (2020) pointed out that the visual convention originates in Global Reporting Initiative (2013, p. 13), which provides guidance for constructing a two-axis graph to illustrate results of materiality assessment. The starting point of both axes is presumably the coordinate (0, 0) at which the importance of a given issue is lowest to stakeholders and the reporting firm. Moving along the axes, issues rise in "importance" or "impact," though numerical scales are not always provided, nor are quantifiable methods given for the plots' positions on the graph. Diagrams like this one convey materiality assessments' end results but obscure the underlying methods, tradeoffs, and decisions.

Telefónica is the exception that proves the rule among the ICT firms in this study. The materiality assessment section of the consolidated management report (Telefónica, n.d.a, p. 11–14) provides detailed description

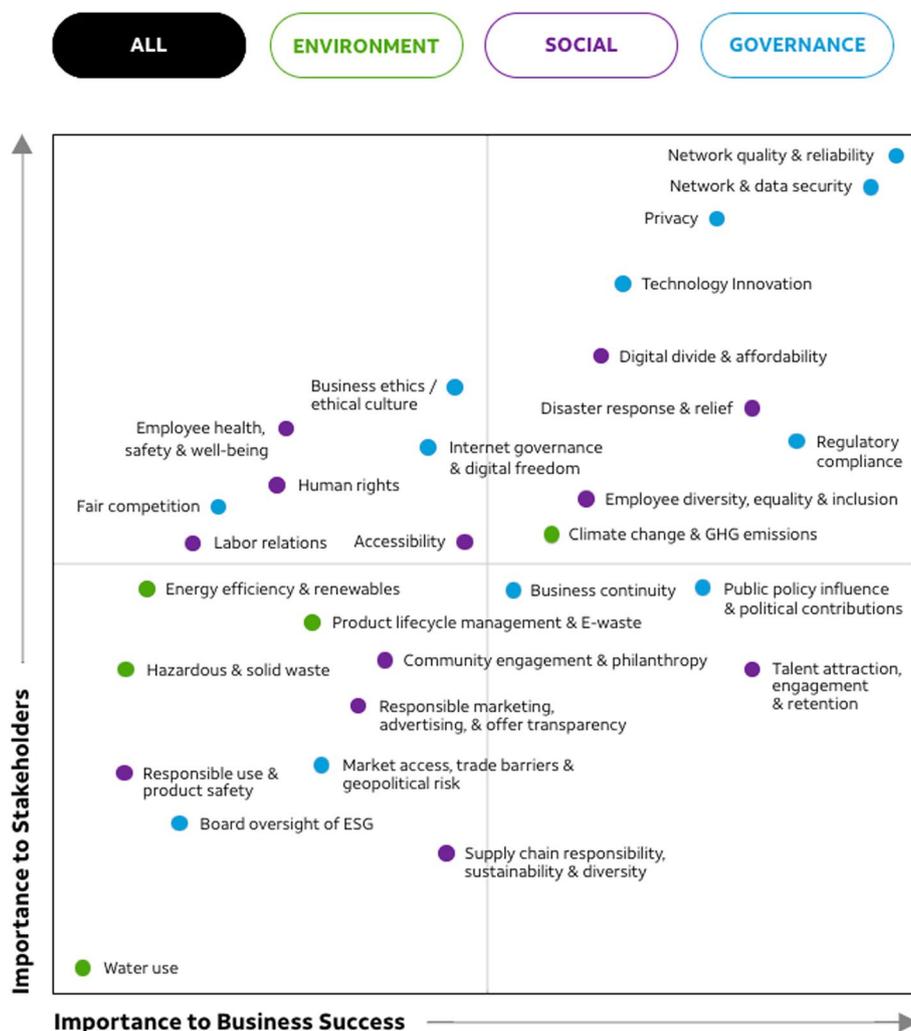


Fig. 2 AT&T, ESG Materiality Assessment Issues Matrix (2021). Published on the AT&T Sustainability Reporting website. URL: <https://about.att.com/csr/home/reporting/stakeholder-engagement.html>, accessed June 17, 2023

of the methodology. For this specific reporting year, the assessment involved an online questionnaire with 125,602 invitees in three market countries, 2,695 of whom participated. The survey was combined with input from senior executives and an advisory panel of external experts. The description includes data analysis methods for sampling, weighting results, and scaling data visualization. Nonetheless, although the extensive description is a frontrunner among ICT firms examined in this research, Telefónica’s report does not provide sufficient information for external validation of the results or offer to make the raw data available.

These findings suggest an epistemic ambiguity in ICT firms’ signals for materiality assessment, and this is both verbal and visual. The results compare with the industry-agnostic review in Ortar (2020, p. 117) of materiality graphs in sustainability reporting in which he argues that

the conventions are rife with methodological problems. He emphasizes that the diagrams’ accuracy and reliability come into doubt for two key reasons. First, they present qualitative information with unclear scaling. Second, they conflate results of surveys or other engagements with two groups of respondents, typically the firm’s internal stakeholders on the X-axis and the firm’s external stakeholders on the Y-axis (Ortar, 2020, p. 117). Visuals with these characteristics play into negative signals in tandem with texts that explain firms’ materiality decision-making in terms of general approach but not scientific methodology.

Selective omission of standard-setter prompts

Selective disclosure is a signaling practice whereby ICT firms give the appearance of aligning with specific reporting standards published by NGOs, such as SASB

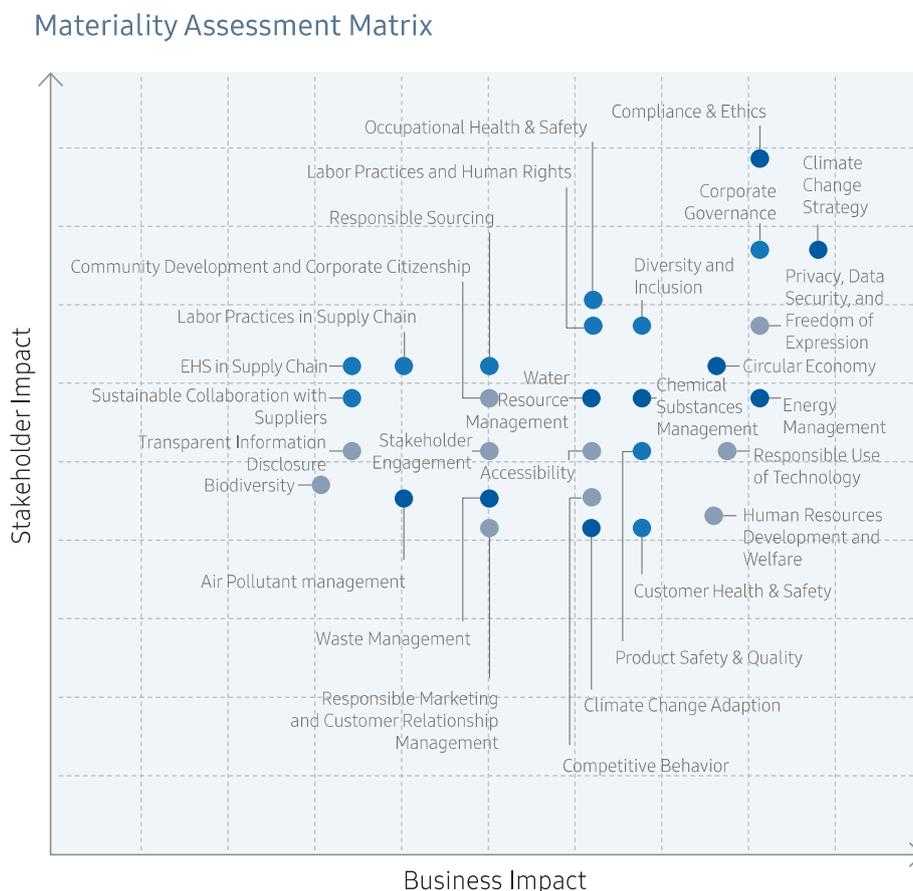


Fig. 3 Samsung Electronics, Materiality Assessment Matrix (2021). Published in the Samsung Electronics 2021 Sustainability Report, p. 73. URL: <https://semiconductor.samsung.com/sustainability/highlights/downloads/>, accessed June 17, 2023

or GRI standards, while covertly skipping some prompts for information. Companies themselves acknowledge this from time to time. Tencent’s 2021 ESG Report references “selected disclosures from the GRI Standards and the SASB Standards,” for example (Tencent, n.d., p. 86 [emphasis added]).

Other firms show a degree of evasion in charts or indices that cross-reference reporting frameworks such as GRI’s or SASB’s with the company’s responses.

Instead of providing the recommended disclosure in the chart or index, some firms hyperlink to another source, typically a public webpage, but the specific data point is not apparent. For example, Meta’s GRI Index links out to the company’s online Transparency Report hub for disclosures on customer privacy instead of providing the narrative and figures requested in the GRI framework (Fig. 4). One GRI guideline, appearing in the first row in the figure, instructs the company

GRI INDEX

GRI 415 - Customer Privacy				
GRI 103	Management Approach	103-1	Explanation of the material topic and its Boundary	Transparency Report ↗
		103-2	The management approach and its components	Transparency Report ↗
GRI 415	Customer Privacy	418-1	Substantiated complaints concerning breaches of customer privacy and losses of customer data	Transparency Report ↗

Fig. 4 Meta Platforms, Inc., excerpt from data index in sustainability report (2021). Published in the Meta 2021 Sustainability Report, p. 108. URL: <https://sustainability.fb.com/2021-sustainability-report/>, accessed June 17, 2023

to explain customer privacy as a material topic and its boundary. In this instance, Meta evades answering the question — a straightforward answer is not found at the link.

Because both GRI and SASB direct companies to disclose on material digital topics, any firm's failure to answer such prompts signals that the power for defining and defending materiality remains with the companies.

Assurance on a limited set of information, not the whole report or a coherent part

Company statements about external assurance provided by third-party auditors gives rise to another form of signaling, which can be negative or positive depending on context. There is no absolute norm for whether CSR reports ought to have external assurance by an independent auditor in addition to internal controls.⁴ In this study, 72.5% (29/40) of ICT firms provided an external assurance statement for nonfinancial information with CSR communications. This would ostensibly lend credence to the companies' disclosures on materiality, but the reality is more complex.

The scope of assured information may be a narrow slice of the document. The focus of assurance is on the reliability of data, and there is flexibility over the scope of the engagement— that is, assurance may be restricted to part of the report. This is largely because assurance may be narrow in scope under the International Standard on Assurance Engagements (ISAE) 3000 (Revised)—Assurance Engagements Other than Audits or Reviews of Historical Financial Information (International Auditing and Assurance Standards Board, 2013). The maturity of auditing norms for nonfinancial information is much less developed than those for financial information, where one expects a specific set of information, the financial statements, to be audited.

ICT firms take advantage of the partial assurance regime for CSR reports, it would appear. While 29 companies present an external assurance statement in the CSR reports reviewed for this study, the idea that the audit applied to most or all of the disclosures in the

relevant document is only illusory. Instead, only limited pieces were audited in 96.5% (28/29) of cases.⁵ There are three primary ways that firms communicate this.

One way is inclusion of an auditor's certificate, often in the form of a letter appended to the CSR report, that specifies what was audited. In 24.1% (7/29) of cases, the assurance was limited to environmental data only, such as renewable energy or emissions. At the other end of the spectrum, audited data has wider scope. For example, Taiwan Semiconductor's external assurance statement describes a scope including the company's "significant Environmental, Social and Governance (ESG) issues and the 2030 sustainability commitment and the topics set forth in the GRI standards" (Taiwan Semiconductor, 2021, p. 226).

The second way is to use icons to denote audited data in the report. Deutsche Telekom's 2021 Corporate Responsibility Report provides pink checkmarks to signal information audited by PricewaterhouseCoopers GmbH (Deutsche Telekom, 2021, pp. 104, 105, 113, 150). These checkmarks are found on four pages of the 172-page report. However, it is not always clear how much of the page they refer to.

The third method is to embed a summary of the independent auditor's work in the body of the CSR report, keeping the company's voice rather than appending a letter from the auditor. For example, Vodafone Group plc (2022, p. 57) describes external assurance of nonfinancial information, stating that "KPMG LLP has provided independent limited assurance over selected data within our ESG Addendum" and then listing 12 metrics subject to the assurance across three categories ("Inclusion for All," "Planet," and "Digital Society").

Of the 40 ICT firms examined for the study, just 27.5% (11/40) communicated external assurance of information on digital responsibility issues specifically. The topics differ, and there is no apparent pattern to how these were reported. The types of audited data and firm names are presented in Table 4.

The rest of the audited information in the firms' CSR reports consist of matters that can be considered non-digital such as environmental, workforce, occupational health, supply chain, and anti-corruption indicators.

One possible reading of ICT firms' approaches to external assurance for nonfinancial information, therefore, is that the engagements are strategically selective, requiring close reading to disambiguate what has been audited from what has not. The resulting signal may become

⁴ Two sets of global standards, it can reasonably be argued, urge firms toward independent audit of sustainability/ESG/CSR reports: (1) the GRI Standards, which state that reporting organizations should seek external assurance for their sustainability reporting, and (2) the SASB Standards, which provide technical protocols for each accounting metric that are intended to be suitable criteria for third-party assurance. See Global Reporting Initiative, 2021, "GRI 2: General Disclosures 2021," Disclosure 2–5 (Disclosure 102–56 in earlier versions) and for SASB see the overview of the standards that appears near the start of each industry-specific set of standards, e.g., Sustainability Accounting Standards Board, "Telecommunication Services Sustainability Accounting Standard," 4 in Sustainability Accounting Standards Board, n.d.

⁵ Huawei's 2021 Sustainability Report is the exception: it includes a certificate of independent assurance from SGS-CSTC Standards Technical Services Co., Ltd., stating that the scope of the assurance included virtually all disclosures in the report, including "the text, and data in accompanying tables, contained in the Report" (Huawei 2021, p. 115).

Table 4 Digital issues in ICT firms' provision of externally assured nonfinancial information

Firm	Externally assured information	Source
América Movil	Fines generated by cybersecurity incidents	2021 Sustainability Report, pp. 127–31
China Mobile Communications	Number of remote rural villages with broadband service newly launched in the "Universal Telecommunications Service Project"; Number of customer spam reports handled	2022 Sustainability Report, pp. 84–85
China Telecommunications	Countries and regions of mobile data international roaming and roaming in Hong Kong, Macau and Taiwan; Mobile service user satisfaction (points); Wireline Internet access user satisfaction (points); Wireline voice user satisfaction (points); Number of new patents granted; Number of new invention patents granted	2021 Corporate Social Responsibility Report, pp. 74–82
Compal Electronics	List of material topics	2021 Sustainability Report, p. 181
Deutsche Telekom	Human rights and employee relations policies and processes	2021 Corporate Responsibility Report, p. 150
Huawei	Material issue data for cybersecurity, privacy protection, digital talent development, technology for balanced development, technology for equity and quality in education, technology for inclusion and equity in health and information accessibility	2021 Sustainability Report, pp. 115–17
NTT	Number of incidents of personal information leaks; suspension of telecommunications services due to cyber attacks from the outside; stable service provision rate; number of confirmed cases of human rights violations; human rights training and attendance	"Independent Assurance Statement" (November 18, 2022), NTT Data Library, https://group.ntt/en/csr/data/assurance/
Taiwan Semiconductor	All material topics	2021 Sustainability Report, p. 226
Telefónica	Number of privacy and data protection fines	2021 Consolidated Management Report, pp. 299–307
Verizon	Network traffic	"Independent Accountants' Review Report" (May 2, 2023), Verizon, Externally Assured ESG Data, https://www.verizon.com/about/investors/independent-accountants-review-letter
Vodafone	Number of M-PESA fintech customers; 4G population coverage percentage; cumulative number of unique users accessing Vodafone's V-Hub service	2022 Annual Report, p. 57

arguably negative if audiences perceive deception in statements about audits that misrepresent their scope, potentially disrupting positive signals about the fact that the company engaged a third-party auditor.

Discussion

Recent moves by regulators and legislators in the United States and Europe have brought materiality and greenwashing into sharper focus, complicating how ICT firms approach CSR communication about digital issues. In the United States, the Securities and Exchange Commission's newly formed Climate and ESG Task Force has a mandate to identify misconduct, with initial efforts targeting gaps or misstatements in issuers' ESG and sustainability disclosures (U.S. Securities and Exchange Commission, 2021). In Europe, the Corporate Sustainability Reporting Directive went into force in January 2023 and requires all large and listed companies—including European subsidiaries of foreign companies—to publish regular disclosures on social and environmental risks they face, and how their activities affect people and the environment (European Union, 2022). Further, the E.U.'s Sustainable Finance Disclosure Regulation began to go into effect in stages as of 2021 and governs transparency in the market for investment products (European Union, 2019), which is expected to have knock-on effects at the companies in which financial firms invest, since investors will require accurate data related to CSR. As multinational ICT companies respond to regulatory developments such as these, they will simultaneously need to navigate increasing complexity in the ways that nongovernmental stakeholders put pressure on CSR communication.

The purpose of this study was to dissect how ICT firms present digital issues as material in their CSR communication in order to appreciate concerns specific to the sector regarding fair representation of data, notably that of greenwashing. The results suggest that, on average, firms in this analysis report 4.44 digital issues as material. Of these, the most frequently cited are data protection (or privacy) and cybersecurity (including data, information, product, and network security). Further, the results suggest that, when ICT firms consider external pressures on their reporting, three NGOs are more represented than other institutions: SASB, GRI, and the United Nations (through its Sustainable Development Goals, Global Compact, and Guiding Principles on Business and Human Rights).

ICT firms' signals about materiality are germane to whether their CSR communication will be perceived as authentic messaging or greenwashing. This study identified three negative signals produced by companies that potentially distort the signaling process: (1) vague approaches to describing and visualizing how the

company determined material issues, (2) selective omission of standard-setter prompts, and (3) assurance on a limited set of diffuse information rather than a coherent section or whole report. These negative signals raise some concerns about ICT firms' approaches to materiality assessment, alignment with external institutions' expectations, and developments in the market for auditing nonfinancial information.

First, poor explanation of a company's method for determining what is material should not be underestimated as a negative signal. Scholars have pointed out that when a company communicates its methods for materiality assessment in a transparent way, it mitigates against accusation of greenwashing by stakeholders (Garst et al., 2022). The methods used in materiality assessment, when treated not as a tick-box exercise but rather as a critical window onto tensions that complicate decision-making, can provide insights into tradeoffs in the company's CSR, ESG, and/or sustainability activities (Garst et al., 2022). When transparently communicated, the raw data and methods allow for more honest and open conversations about the firm's priorities and agenda-setting. While allowing flexibility for companies to customize their materiality assessments, some degree of systematizing procedures might be needed to build trust among stakeholders and to advance reporting practices beyond suspicion of greenwashing. Scholars have already called for development of quantitative methods in materiality decision-making (Calabrese et al., 2015; Edgley et al., 2015). Some have proposed models using a grading system (Calabrese et al., 2016) or questionnaire-based matrix (Ortar, 2020). Reports examined for this study, however, suggest that ICT firms describe their materiality assessments in ways that are not systematic but vague, thereby offering negative signals about how materiality was determined.

Second, omission of information requested by standard-setters is a risky endeavor. Deliberate underreporting on sustainability or ESG initiatives has been referred to as "greenhushing" (Font et al., 2017; Ettinger et al., 2021; Ginder et al., 2021). This phenomenon is seen as a survival strategy for companies that fear judgment by the media, activists, journalists, academics, or others (Vollero, 2022, p. 97). Empirical understanding of reactions to greenhushing is scant, but, as Vollero (2022, p. 98) emphasizes, the potential consequences of this practice cannot be underestimated. Nevertheless, the present study found that the ICT sector uses selective omission at times to respond to standard-setter suggestions for information about digital issues. These exclusions can be understood as negative signals about materiality of digital topics.

Third, the institution of audit is immature as a form of governance for nonfinancial information, and this

poses a tough choice for companies: opt into a fragmented auditing regime or not. Gadinis and Miazad (2021, p. 97) point out that companies often engage external auditors for sustainability assurance much as they do for internal controls and compliance, and that all Big Four firms offer sustainability assurance audits. Still, evidence of assurance examined in this study revealed that scope of engagement for digital issues is narrow, giving a cherry-picked effect that is ripe for interpretation as a negative signal and criticism as greenwashing.

The significance of the study findings are twofold. First, this research has direct and immediate utility for management involved in producing or overseeing CSR communication, particularly those that focus on nonfinancial reporting. Managers who are concerned about regulators and legislators cracking down on ESG communication should take a critical look at governance of reporting practices which may in the future be perceived as deceptive. This study suggests three areas where tighter oversight might be necessary: materiality assessment description, responses to reporting frameworks built by standard-setters, and audit of nonfinancial information. Specifically, improved governance should encourage the following practices:

- Presentation of materiality assessments in CSR reports should contain fair and accurate descriptors that do not use mathematical language unless substantiated by the underlying data. Accompanying graphics, such as materiality matrices, should not offer a deceptive visualization of mathematical scale, scatterplot, or weights.
- When reporting in alignment with recommendations from standard-setting organizations, companies should be forthright when choosing not to answer a given prompt, explaining why the requested information is not applicable or reportable instead of burying a non-answer in a hyperlink or other ruse.
- Statements about third-party assurance should be worded and placed in ways that do not exaggerate the scope of the audit. Assurance certificates and letters from independent auditors should be placed so that they appear next to—or linked to—the part of the report that reflects their scope, not at the back of a report where their location may suggest that they refer to the whole document.

The above recommendations give managers three concrete changes they can make to tighten reporting practices and associated controls.

Second, this study enhances our theoretical understanding of CSR communication in the ICT sector by

applying signaling theory to examine information asymmetry between companies and their external stakeholders. Although signaling theory is a widely used theoretical framework for CSR topics, this study found little academic effort to investigate signals about CSR for digital issues in the ICT sector. This research addresses the gap by using signaling theory to examine presentation of material digital issues in CSR reports of 40 ICT companies in the 2022 Global Fortune 500. This theoretical approach suggests that at least three signals can be understood as negative, with potential to disturb a company's signaling effort. These negative signals arise in the ways that ICT companies present materiality assessments, information requested by standard-setters, and assurance scope.

Conclusion

When different stakeholder groups become increasingly critical of companies or an industry, communication management becomes important for the social license of organizations involved. As this research has shown, signaling the company's approach to materiality may be a compelling but complicated path to maintain or improve reputation and competitive position. A key hazard is that disconnect between CSR talk and action may appear clumsy or be uncovered as greenwashing, potentially generating adverse effects for the company.

This study contributes to scholarship in CSR by showing that disclosures on digital issues are a complex part of nonfinancial reporting by ICT companies, which navigate constraints imposed by institutional pressures, evolving norms in stakeholder governance, and different meanings of materiality, among other factors. It achieves this understanding analytically by examining nonfinancial disclosures by 40 large-cap ICT companies in their CSR communication (inclusive of ESG, sustainability, integrated, consolidated management, purpose, impact, and annual reports; issue briefs; and web sites). While disclosures on cybersecurity, data protection, privacy, accessibility, and a range of other digital technology-related topics present opportunities for positive signaling about the company and its handling of materiality, there exist possibilities for negative signals too, which might raise suspicion of greenwashing, even if unintended. To put these findings into scholarly and practical context, this paper integrates groundwork from accounting, management, organizational communication, and business ethics.

For managers this paper suggests implications for strategic and operational business planning regarding materiality disclosure. It suggests three areas where tighter

oversight and controls might be necessary: materiality assessment description, responses to reporting frameworks built by standard-setters, and audit of nonfinancial information.

This paper extends the application of signaling theory to CSR by turning to the presentation of materiality in CSR reports with a focus on digital issues in the ICT sector. It expands current approaches to negative signals by exploring how they can distort the signaling process in companies' presentation of materiality in CSR communication and linking such perturbations to greenwashing.

Despite the importance of what ICT companies say in CSR communication, what they do *not* say carries its own weight. This study showed that silences and gaps are vital parts of signaling in the ICT sector's CSR communication. In drawing fresh attention to them, this research enriches our picture of the sector's transparency regime and possible future directions for enhancing trust in it.

Although this work is a major first step forward to examine materiality signaling in the ICT sector, the approach has some limitations that open up a basis for further research. The first limitation is that this study focuses on 40 selected ICT firms' nonfinancial reporting collected at a particular point in time. Research that is inclusive of a bigger sample and other forms of communication (e.g., videos on company websites, disclosures in regulatory filings) would allow for comparative study. Further, longitudinal research is needed to assess the degree to which CSR communication presents stable or evolving social meanings of materiality in the sector. The second limitation is that the dataset is not segmented by geographic region. Comparing results by the location of each company's headquarters or another indicator, such as primary business language spoken at each headquarters, could yield results that suggest patterns not uncovered by the present study.

Future studies can add valuable perspectives by assessing effectiveness and reception of ICT firms' materiality signaling. CSR reporting may be a normative activity that helps bring accountability to organizational behavior (Gray et al., 1997; Deegan, 2002), although to gain greater traction on how this communication practice operates, researchers must drill down to specific social contexts and attend to its long-term, indirect effects (Pozen, 2020). Companies might disclose information but not change their actual practices. The effectiveness of reporting partly depends on whether the information shapes the decision-making of stakeholders who then apply pressure on companies to improve their conduct. Further research is needed to ascertain which disclosure strategies are perceived as judgment-useful by specific audiences, for example, investors in ICT companies.

Abbreviations

CSR	Corporate social responsibility
ESG	Environmental social governance
ICT	Information and communication technology
GNI	Global Network Initiative
GRI	Global Reporting Initiative
NGO	Nongovernmental organization
RDR	Ranking Digital Rights
SASB	Sustainability Accounting Standards Board
SEC	U.S. Securities and Exchange Commission
UN GC	United Nations Global Compact
UN GPs	United Nations Guiding Principles on Business and Human Rights
UN SDGs	United Nations Sustainable Development Goals
WBA	World Benchmarking Alliance
WEF	World Economic Forum

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Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Declarations

Competing interests

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