From Footprint to MindPrint

Towards Corporate Accountability 3.0

Draft version of a working paper for The University of Chicago, Stevanovich Institute on the Formation of Knowledge

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Table of Contents

Executive Summary – Human Action and MindPrint Plea

This paper presents a new and challenging view on corporate accountability. Next to financial reporting, we propose to extend the reporting of corporate environmental, social and governance (ESG) responsibilities with material information on how corporate activities affect core aspects of 'being human'. In this work we combine knowledge from various, seemingly unrelated academic fields, mixed with insights from corporate reporting practices, and also, perhaps more importantly, include a plea for 'Human Action'.

Indeed, 'Human Action' not only directed towards economic freedom (as Ludwig von Mises wrote (Von Mises, 1998)) but also as a call to corporates and their gatekeepers, to create transparency on how their products and services are developed, and whether these innovation processes contribute to, and protect what is essential in 'being human': adapting von Mises definition (in blue):

> **"**A man is free as far as he can live, *flourish* and get on without being at the mercy of arbitrary *(or hidden)* decisions on the part of other people *and corporations*"[1]

The current focus of ESG accountability is, in terms of the well-known human needs pyramid (Maslow), mainly directed towards the elementary levels of: environment, health and food, safety and shelter, and tangible risks to our 'living-in-the-world'. The 'higher', psychological and more intangible levels involving belongingness, esteem, human prospering and self-actualization are not measured and managed within the current ESG reporting framework.

Advances in so-called persuasive technologies, the embedding of algorithms, artificial intelligence and inappropriate use of personal data in platform-services and in social media, have recently led to public debate on infringements to human values and even outcry. The products and services based on these primarily technology driven innovations are increasingly becoming 'intimate', both at a conscious and unconscious level, and constitute risks and opportunities to our agency, integrity, privacy and flourishing. However, also in industries not directly linked with advanced and new technologies, products and services are being developed, marketed, 'nudged' and/or 'curated' that impact human agency and/or well-being. We therefore believe that the MindPrint concept can also be extended to products and services from industries in pharmaceutics, healthcare, cosmetics, fashion and leisure, financial services, media and communication – we conject that, very much comparable to industry

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[1] Ludwig von Mises: 'Human Action: A Treatise on Economics – the Scholar's Edition (1998); original published in 1949)

specific ESG standards, the accountability framework for 'human well-being' will need to consider industry specific risks and opportunities.

We claim that these risks and opportunity to our 'being-in-the-world', in which human agency, self-directedness and other ethics considerations are key elements, should be included in corporate accountability. Like ecological footprint[2], a measure on how corporations and individuals affect outside world climate, we propose, with help of academia and accountability experts, to create an industry specific measurement framework for these more intangible impacts of products and services on human well-being – hence the project name MindPrint.

Very similar to corporate control measurement frameworks that organizations utilize to ensure that their business and financial processes are 'in-control', we suggest that corporate innovation processes should also include control measures that are suggested in or can be based on research frameworks of the Capabilities Approach, Responsible Research and Innovation, and so-called Positive Technology and Positive Design studies. We assert that as we can either sense, or clearly consciously perceive these 'softer' human impacts of innovation, we should be able to develop measures (and controls) for these impacts, either qualitatively or quantitatively. If companies want to be 'in-control' of these more intangible aspects of their products and services, they will need a measurement, controls and reporting framework that focuses on these intangible or 'invisible' aspects: 'what gets measured, gets managed'!

The research domains of Positive Technology and Design are based on foundations of Positive Psychology[3] that aim at human flourishing and well-being. Therefore, we would like to call this ESG paradigm-extension the 'Eudaimonic Turn'[4], referring to the ambition that companies should excel and play a leading role in the process of enhancing human well-being. This turn by corporates to explicitly include human well-being in their strategic objectives will require different leadership skills and mobilization of knowledge domains, often unfamiliar to business leaders. Business Schools and Humanities faculties thus have an important boundary-spanning challenge to face up to. The Eudaimonic Turn will hopefully lead to 'closer encounters' between those who have been 'studying business' for approximately 100 years, and those who have been in the business of understanding our 'being-in-the-world' for more than 2500 years.

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[2] The term 'Ecological Footprint' was first introduced by William Rees. See also (Wackernagel & Rees, 1996)
[3] For an introduction see: (Martin E. P. Seligman & Csikszentmihalyi, 2000)
[4] Based on the term used by Pawelski in 'The Eudaimonic Turn: Well-Being in Literary Studies (Pawelski, 2013)

We suggest that Institutional Investors, who already have a mandate in many jurisdictions on including ESG considerations in their portfolio construction, together with business schools, take the lead in developing and promoting this new accountability paradigm. These investors have a longer-term investment view and their fiduciary duties to their constituents often include explicit consideration of ESG factors. We propose that, next to academics, the architects of this extended Corporate Accountability framework also include representatives of larger multinational corporations, securities regulators, the Big4 accounting and consulting firms, and stakeholder representatives. Next to these stakeholders of this extended ESG accountability framework we would like to invite leading non-financial reporting standard setters and ESG data firms to participate in this debate on developing accountability standards that properly value us on the vectors of 'being human'.

In conclusion, academics from Business Schools and the Humanities are encouraged to seek new modes of cooperation to share unfamiliar knowledge domains and develop new leadership methods infused by knowledge that defines the core of eudaimonics in corporate governance – a 'true and fair view' on what is 'a good life'.

We look forward to getting your feedback, human action and involvement, and end by quoting:

> *"The essence of the human, it seems, is the technical; which is paradoxically the other of the human: the non-human, the manufactured, unnatural, artificial; the inhuman even."*
> ((Vaccari, 2009) on Bernard Stiegler, *Technics and Time,* 1998)

Acknowledgments

Introduction

The contribution of companies to financial income creation and its impact on the fair distribution of wealth have been extensively articulated in research and in public debate thereon; a 150-year history of advances made in business studies and practices attest to the field of knowledge on corporate financial accountability as being 'grown-up'. We like to refer to this as "Corporate Accountability 1.0."

The recent avalanche of corporate governance scandals, combined with the financial crisis, has resulted in a wider debate - both public and in academia - seriously questioning the moral responsibilities and behaviours of companies and their executives (Goshal, 2005; Klikauer, 2015), and (Fred H. M. Gertsen, van Riel, & Berens, 2006; Fred H.M. Gertsen, 2009) In addition, the study of how companies and their executives deal with environmental, social and governance (ESG) aspects has also developed into a major strand of research in business schools in recent years. Next to ESG, the term 'Corporate Social Responsibility' (CSR) and/or Sustainability, are also often used in this body of literature (Dahlsrud, 2008; Garriga & Melé, 2004). We like to refer to this domain of corporate governance, environment and society as "Corporate Accountability 2.0."

The central thesis of the MindPrint project, which is introduced in this paper, is that currently, in the ESG/CSR debate and practices, important values and aspects of 'being human' (and the potential for human flourishing) are being overlooked and neglected by corporations and their gatekeepers. Companies not only have an impact on our ecological and social environment; they also construct, deconstruct, and/or destroy facets of human nature and culture which are crucial to human agency, well-being and human flourishing. These core human facets include, but are not limited to: mental capacities, perceptions, mindset, behaviour, identities, values and ideals, virtues, and cultural traditions and practices. Companies influence these matters - both at a conscious and unconscious level - as a participant in social and political life, through their role as employer, as manufacturers and/or service providers, and through their selling of products and services to consumers. "Although several companies [...] have assumed responsibility for many parts of their operations through CSR", Van de Poel et al. (2017) note, "they have only done so to a limited extent for their R&D and innovation process."

Public Outcries for Extended Corporate Accountability

At the same time several recent examples of possible corporate ethicality breaches that caused public outcry and have most likely impacted human integrity show the importance of

widening corporate accountability beyond ESG concerns. One example is the recent news that Cambridge Analytica has used data that an academic had allegedly improperly exfiltrated from Facebook to build psychological profiles of millions of Facebook clients, which could then be matched with other publicly available data sets. Technology experts working in the data field publicly reported that the issues raised by the Cambridge Analytica case raise deep concerns about the lack of corporate accountability and corporate oversight. Stephanie Hare, a tech expert who has worked in the data field reported to the BBC: "What is really striking here is the absence of any oversight"; in the same interview she also states: "It's our job as technologists to design systems that are safe," and she continues: "I don't get on an airplane as a passenger and make my own safety checks".[5]

On March 19/21, 2018, shortly after the news about Cambridge Analytica, Facebook share-price dropped some 10%, representing a capital market loss in excess of US\$ 50 billion, in just three days.[6] Other recent examples where corporate practices are being questioned on ethicality or on consumer well-being implications include:

- On child addiction and distraction: January 6, 2018, in an 'Open Letter' two major asset managers (Jana Partners and CALSTRS) plea to the Board of Apple Inc., to take account of children's needs and distraction-weaknesses in designing their technological products/services. Their request follows alarming reports, referred to in the letter, on the implications of excessive and addictive use by children of the iPhone/iPad and the consequences for their well-being.[7] (Also see: 'The Distracted Mind' (Gazzaley, 2016))

- On adolescent screen usage and well-being: In nationally representative yearly surveys of United States 8th, 10th, and 12th graders 1991–2016 (N = 1.1 million), psychological well-being (measured by self-esteem, life satisfaction, and happiness) suddenly decreased after 2012. The survey showed that "adolescents who spent more time on electronic communication and screens (e.g. social media, the Internet, texting, gaming) and less time on non-screen activities (e.g. in-person social interaction, sports/exercise, homework, attending religious services) had lower psychological well-being" (Twenge, Martin, & Campbell, 2018).

- On young children's' privacy and development: In October 2017, toymaker Mattel discontinued plans to build an "all-in-one voice-controlled smart baby monitor," the Verge reports that: "… after complaints about the device were raised by consumer protection

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[5] BBC site accessed on April 24, 2018: http://www.bbc.com/news/technology-43458110
[6] https://www.businessinsider.nl/facebook-ceo-mark-zuckerberg-responds-to-cambridge-analytica-scandal/?international=true&r=US
[7] https://thinkdifferentlyaboutkids.com

parties, consisting of privacy advocates and child psychologists". "A petition asking Mattel not to release the Aristotle gained more than 17,000 signatories. Underwriters of the petition claimed that the device not only infringed on children's privacy by collecting their data but could also have an unknown effect on their psychological development".[8] For research on Voice Assistants see Hoy (2018).

- On freedom of choice: On December 14, 2017 the New York Times reports: "In the US the Federal Communications Commission voted in December 2017 to dismantle so-called 'Net Neutrality' rules regulating the businesses that connect consumers to the internet, granting broadband companies the power to define the online experiences of US citizens. The process followed by the FCC in seeking public comments on its revised regulation has apparently been subject to manipulation and fraudulent software practices".[9]

- On autonomy and self-directedness: In the public domain and in academia there is widespread concern on how social media create "filter bubbles" and "echo chambers" which leads individuals being mainly exposed to conforming opinions, thereby corrupting self-directedness and autonomy (Flaxman, Goel, & Rao, 2016). These developments can also impair free speech and democracy, as argued by Balkin (forthcoming).

- On privacy: In 2016 ProPublica [10] reports that "since October 2009, health care organizations and their business partners reported 1,142 large-scale data breaches, each affecting at least 500 people, to the U.S. Department of Health and Human Services".[11]

- On fair competition and consumer choice: Google's EU fine of Euro 2.4 billion for its abuse of its dominance of the search engine market in building its shopping comparison service. Google has contested the fine. The EU commission ruled that this preferential treatment by Google of its own content is illegal and anti-competitive. Margrethe Vestager, the European Union's Competition Commissioner stated: "It (Google) has denied other companies the chance to compete on their merits and to innovate, and most importantly it has denied European consumers the benefits of competition, genuine choice and innovation"[12]

These examples show that in particular advanced and so-called persuasive technologies impact consumers and human well-being.

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[8] https://www.theverge.com/2017/10/5/16430822/mattel-aristotle-ai-child-monitor-canceled
[9] https://www.brookings.edu/blog/techtank/2018/01/18/net-neutrality-debate-exposes-weaknesses-of-public-comment-system/
[10] ProPublica is an independent, nonprofit newsroom that produces investigative journalism.
[11] https://www.propublica.org/about/
[12] http://www.bbc.com/news/technology-40406542

The MindPrint Project

What is thus needed, we propose, is a move in the direction of "Corporate Accountability 3.0", which takes a broader range of values and dimensions of 'being human' into account in defining corporate responsibilities towards shareholders and other stakeholders. Corporate Accountability 3.0 not only looks at overall good corporate governance and CSR, but also looks at the management of responsible product/service innovation, design, marketing and delivery practices. Project MindPrint will develop the conceptual framework for describing, analysing, and disclosing the impact that companies have, through the innovations they design, develop and market, on consumers, employees and other stakeholders, in their well-being and functioning as 'being human.' This new approach will result in a more consistent, comprehensive and sustainable picture of corporate practices and their imprint on 'being human' in a rapidly developing technological world.

History has shown that corporate practices on accountability and transparency depend on, and benefit from, the existence of a level playing field; a system that is based on uniform disclosure practices and is promulgated by independent institutional standard setters and their gatekeepers (see Chapter 4). Therefore, under 'Accountability 3.0, to hold companies consistently accountable, it is important to develop a conceptual framework and a set of uniform principles and practices. This conceptual framework will serve to assess and compare companies on their 'Accountability 3.0' performance – very much comparable to the role of ESG reporting standards developed in the last 30 years. These standards on CSR (or ESG) include the Global Reporting Initiative (GRI), UN Global Compact, and more recently the standards of the Sustainability Accounting Standards Board (US), and the Task Force on Climate Related Disclosures (TCFD); we like to refer to these standards as directed towards Corporate Accountability 2.0. The metaphor often used for these disclosures is ecological (and or ESG) 'footprint'. The name 'MindPrint' refers to our ambition to develop the next level of corporate accountability.

Developing the MindPrint concept and methods requires a multi-disciplinary approach, including academics and practitioners from a variety of fields. This will need to ignore the predominant culture of (accountability) practitioners and academics, sticking to the dominant logic of their primary practice and research area. Evidently, studying the impact of companies on human well-being and agency will require input from academics in economics, finance, business management and - above all - from the humanities[13] and fields of study concerned

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[13] "The term 'humanities' includes, but is not limited to, the study and interpretation of the following: language, both modern and classical; linguistics; literature; history; jurisprudence; philosophy; archaeology; comparative

with technology, such as innovation management, science and technology studies and philosophy of technology. It also requires including relatively new fields such as: positive computing/technology, cyber-psychology, positive psychology, well-being studies and the capabilities approach.

Set-up of This Working Paper

The set-up of this working paper is as follows. First (**chapter 1**) we will introduce the current state of affairs with respect to accountability for environmental, social and governance (ESG) issues, developments in fiduciary responsibilities of management and pressures on full and fair disclosure of 'material' corporate issues; in summary, developments in Corporate Accountability 2.0. Next (**chapter 2**) we will explain how Corporate Accountability 3.0 is different. We will introduce the concept of responsible research, innovation, development, production and marketing. Subsequently we will distinguish between (measuring) the tangible and the more intangible impacts of technology product/service innovation. To illustrate the urgency of Corporate Accountability 3.0 we will also give several examples of the ethical issues raised by new technologies. Finally, we will introduce the capability approach and positive psychology as two most promising and useful approaches to defining corporate responsibilities for consumer well-being and human agency. Subsequently (**chapter 3**) we discuss the challenges of managing and measuring Responsible Innovation, especially taking into account the intangible impacts of technology and its subsequent 'going to market'. We will argue that these challenges can be dealt with effectively and efficiently, as there is an increasing body of literature on tools and approaches to implement responsible innovation, as well as literature on the corporate potential of positive technology and capability sensitive design. Finally (**chapter 4**) we will sketch the outlines of the MindPrint project that we would like to work on together with academia, corporates, institutional investors, consulting firms, consumer organizations and other stakeholder representatives.

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religion; ethics; the history, criticism and theory of the arts; those aspects of social sciences which have humanistic content and employ humanistic methods; and the study and application of the humanities to the human environment with particular attention to reflecting our diverse heritage, traditions, and history and to the relevance of the humanities to the current conditions of national life." --National Foundation on the Arts and the Humanities Act, 1965, as amended.

1. Corporate Accountability 2.0: Environmental, Social & Governance (ESG) Aspects

1.1 Financial Reporting or Corporate Accountability 1.0

In most countries, company law requires companies to follow 'generally accepted accounting principles', such as IFRS or US GAAP, in preparing their legally required financial reports. In addition, stock-exchange regulations also require companies to use financial reporting frameworks, and/or in some territories, non-financial reporting standards for their filing of annual, or quarterly company reports. Financial reporting frameworks:

- provide guidance on corporate reporting;
- provide guidance to corporations on how to report value-relevant information;
- provide guidance to corporations on their management accounting architecture;
- assist corporate preparers in practices for which no standards as yet exist;
- assist users (shareholders, capital market participants and other stakeholders) in interpreting financial information and making financial investment decisions;
- assist institutional investors in constructing investment portfolio's
- assist auditors in forming their opinion on financial statements;
- should assist in making standards consistent and coherent;
- are used as rational in making choices in standard setting;
- serve as a guide to accounting standard setters;

Interestingly, in financial reporting standards came first; thereafter, in order to create a proper process for further standards setting and continuous development, conceptual frameworks undergirding the standards were developed. Conceptual frameworks include definitions of financial elements such as assets, liabilities, shareholders' equity, provisions, revenues and expenses, and their valuation and measurement attributes. In addition, a taxonomy and order of elements for presentation purposes is included, as well as criteria for when to account for certain financial events. Often used concepts include relevance, materiality, comparability and uniformity. Qualitative criteria include prudence, substance over form, representational faithfulness (reliability), understandability, complexity, and materiality.

1.2 ESG Standards and Corporate Reporting as a Widely Spread Phenomenon

Social responsibility was first formally discussed by Bowen (1953), called by many the father of CSR, in his book *Social Responsibilities of the Businessman*. He referred to CSR as "the

obligations of businessmen to follow the objectives and values of society and produce social goods beside economic goods". In a seminal synthesis, P. E. Murphy (1978) classified CSR progress into four epochs: philanthropic era (hitherto 1950s), awareness era (1953-1967), issue era (1968-1973), and responsiveness era (1974-1978). However, it was Carroll's (1979) influential paper that paved the way for a better understanding of CSR. He defined CSR as *"the social responsibility of business encompasses the economic, legal, ethical and discretionary expectations that society has of organizations at a given point in time"* (p. 500). Furthermore the idea of ecological footprint (Wackernagel & Rees, 1996), not just of individuals but also of companies, has been publicly discussed and studied by scholars for some 25 years now. It is an impact measure and a symbolic metaphor that appeals to the imagination, but of course it does not cover the full scope of what is known as 'environmental, social and governance' or ESG performance. See table 1 for examples of issues in all three dimensions of ESG. During the last twenty years a multitude of further concepts and methods for analysing and measuring the ESG aspects of corporate operations has been developed.

Environmental Issues	Social Issues	Governance Issues
• Climate change & carbon emissions • Air & water pollution • Biodiversity • Deforestation • Energy efficiency • Waste management • Water scarcity	• Customer satisfaction • Data protection & privacy • Gender & diversity • Employee engagement • Community relations • Human rights • Labor standards	• Board composition • Audit committee structure • Bribery & corruption • Executive compensation • Lobbying • Political contributions • Whistle-blower schemes

Table 1 - Examples of ESG Issues[14]

Standards and guidelines regarding Corporate ESG Responsibility / Accountability have been promulgated by a variety of organizations and gatekeeper initiatives. Some of these come from the private sector, such as the GRI (Global Reporting Initiative), the IIRC (International Integrated Reporting Framework), the CDSB (Climate Disclosure Standards Board), and the SASB (Sustainability Accounting Standards Board). In addition, other initiatives have been developed by (supra) governmental authorities, such as the OECD (Guidelines for Multinational Enterprises), the United Nations (UN Global Compact + UN Guiding Principles on Business and Human Rights), and the International Labor Organization (Tripartite Declaration). There are also some institutes looking after ESG standards for specific industries.

Waddock (2008) estimates that over 150 NGOs worldwide participate in some aspect of the CSR movement, such as establishing principles, offering certification and membership in

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[14] Source: CFA Institute (2015)

organizations, providing assurance of accuracy in CSR reports, and serving as activists. In a 2017 symposium of the Sustainability Accounting Standards Board, its Chair, Dr. Jean Rogers reported that: "Today, about 26 percent of global assets under management are invested using sustainable strategies. She continues: "…the assets of signatories to the Principles for Responsible Investment have more than doubled to $68.4 trillion"[15]. Recent research by Bank of America Merrill Lynch also finds that ESG metrics prove to be the best signal for future earnings volatility risks[16]. However, these positive findings are also blurred by the proliferation of ESG standards and data providers which makes comparability and measurement consistency difficult to achieve. Based on a review of this great variety in current practices and various reporting frameworks, Rahdari and Anvary Rostamy (2015) set out to find the most common indicators for the assessment of environmental, social and governance aspects of business performance.

Many companies take their responsibility and accountability with regard to ESG issues quite seriously. This is, for example, shown by the steady increase in the last 15 years in the number of companies filing a report with the GRI, the leading global institute for standards on sustainability reporting. According to their 'sustainability disclosure database' 5.911 companies have published an ESG report in 2016.[17] This does, of course, not mean that there is still not room for improvement on ESG performance. The 2016, first Corporate Human Rights Benchmark (CHRB) analysis of the 98 largest global corporations revealed, for example, that most human rights issues are still managed reactively instead of proactively[18]. Further developments are still taking place in the field of ESG reporting. Attention for consumer data protection and privacy is, for example, relatively new and increasing.

1.3   The Importance of 'Materiality' and Institutional Investors

A recent meta-study, reviewing the evidence from more than 2.000 empirical studies, concludes that 75% of these studies show that corporate financial performance is positively correlated with higher scores on the management of environmental, social and governance issues. In addition, 90% of studies show that there is at least a non-negative relationship to corporate financial performance (Friede, Busch, & Bassen, 2015). This confirms earlier work that also showed that 'ethics pays' for companies and their shareholders.[19] It is thus not just

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[15] SASB speech: http://using.sasb.org/wp-content/uploads/2017/11/Symposium-Speech-2017-Jean-Rogers_final_.pdf
[16] BofA Merrill Lynch: (accessed april 24, 2018)
https://www.bofaml.com/content/dam/boamlimages/documents/articles/ID17_0028/equityStrategyFocusPointADeeperDive.pdf
[17] http://database.globalreporting.org/
[18] https://www.corporatebenchmark.org/
[19] For an overview see http://ethicalsystems.org/content/ethics-pays

legal or moral responsibility that should stimulate ESG policies, but also enlightened self-interest.

These research findings provide substantive evidence that decisions made by many (institutional) investors to explicitly include ESG criteria in their policies and practices for asset selection is prudent from a longer-term investment perspective. An additional advantage of the proliferation and detailed requirements of ESG standards is that it has contributed to the existence and assemblages of a great number of data points. Institutional Investors, such as MCSI, Sustainalize, and Blackrock, use between 600–1000 data points on a variety of ESG dimensions. These data points amalgamate into (relative and arbitrary) scores used to benchmark individual companies on their ESG performance. The current world of social media and big data provides no 'secrecy shelter' for companies anymore.

The challenge for both single and institutional investors is to distinguish between ESG data points that are, in terms of accountability in the field of financial markets, either 'material' or to a smaller or larger degree 'immaterial.' Material factors are those issues that are perceived as important to shareholders and/or stakeholders and by means of proper corporate disclosure and 'acting-on' have proven to result in a positive correlation with financial performance. The better an investment firm is able to construct portfolios of companies that disclose (and act on) important material issues, the better they will be at making longer-term 'premium returns' – see figure 1 (Khan, Serafeim, & Yoon, 2016). Therefore, strategies on investment portfolios, that include an assessment of corporate accountability and transparency on material issues, are expected to have superior market performance and thus are able to attract additional capital at more favourable terms. Evidently, corporations that need additional capital for innovation are expected to benefit from full and fair disclosure of material issues.

These findings on the importance of disclosing material issues stimulate so-called 'Integrated Reports' (IR) by companies, in which they present how financial indicators and strategically important non-financial performance indicators drive the value of companies (R. G. Eccles & Krzus, 2014). The literature on Integrated Reporting shows that companies benefit from IR practices through a better understanding of their value creation process (Burke & Clark, 2016) and hence, better decision making. A clear internal view on how and where values are created for customers, supports product/service design processes and can assist corporate (product) branding and help to increase customer satisfaction. A second advantage is better internal corporate communication that results in a greater focus on what is material for customers and other corporate stakeholders. Finally, IR develops measures in areas relevant to customers that were previously un-examined.

Interestingly, material issues are not restricted to traditional financial and/or current ESG factors. The current public debate on corporate responsibility and accountability also includes areas such as: addictive products/services, fake news, disruption by platform business models, application of big-data technologies and AI in responsible product design and development, and so on – this leads us to the development of Corporate Accountability 3.0, which will be developed in the MindPrint project.

Effect on financial returns of investors' treatment of environmental, social, and governance (ESG) issues,[1] annualized alpha
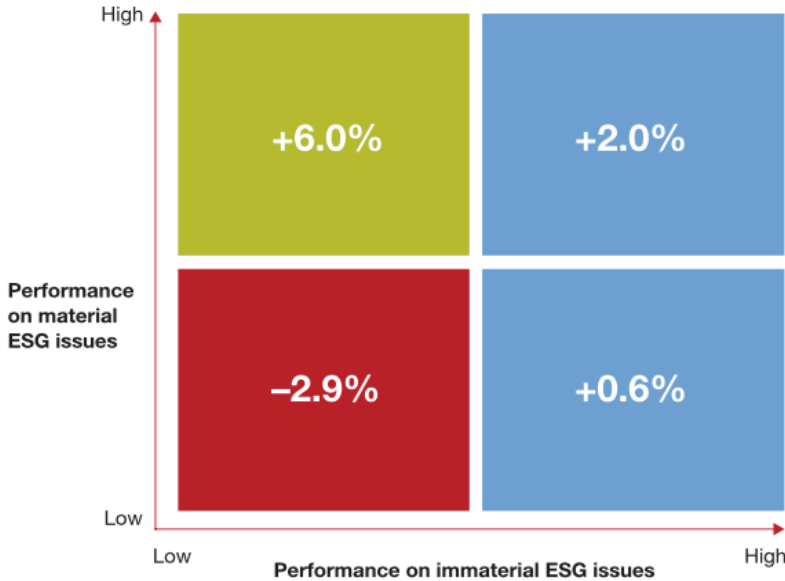
Figure 1 – A Focus on Material ESG Issues Drives Greater Returns[20]

The relevance of ESG management for/to investors is illustrated by a variety of studies and surveys performed by asset managers, consulting firms and ESG gatekeeping institutes. They provide compelling evidence that 75% of CEO's agree that ESG factors are important capital asset investment considerations (PwC, 2014); 70%(+) of female investors agree that ESG factors are important share allocation considerations (Hale, 2016), and 84% of millennials are interested in sustainable investing (Global Sustainable Investment Alliance, 2016). In recent years these interests in ESG investing have also translated in a strong increase in so-called Responsible Investment Strategies; some $23 trillion is involved (Global Sustainable Investment Alliance, 2016).

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[20] Figure is based on the paper by Kahn, Serafeim & Yoon (2016) and taken from the following source: https://www.mckinsey.com/industries/private-equity-and-principal-investors/our-insights/sustaining-sustainability-what-institutional-investors-should-do-next-on-esg

Currently, business scholars and the financial industry consider ESG accountability (Corporate Accountability 2.0) as a next logical step up from basic 'old' financial accountability (or Corporate Accountability 1.0). The consideration of ESG factors for investment decisions is even more logical from the perspective of institutional investors like asset managers and pension funds as their fiduciary duties include looking after the interests of their constituents. In many jurisdictions in the world, such as the European Union, law requires that institutional investors include ESG considerations in their investment portfolio policies and subsequent decision-making. MCSI (2017) reports that: "since its founding in 2006, the United Nations Principles for Responsible Investing (PRI) has attracted support from more than 1,800 signatories representing over USD $68 trillion in assets under management as of April 2017"[21] ('support' is not equal to 'investment policies'). A recent McKinsey study found that more than a quarter of the $88 trillion assets under management globally are now invested according to environmental, social and governance principles known as ESG.[22] The Global Sustainable Investment Alliance (2016) reports that in 2017, some $ 23 trillion of assets are being professionally managed under responsible investment strategies.

Interestingly, in a recent Finance Working Paper of ECGI[23], '*Companies Should Maximize Shareholder Welfare Not Market Value*', Oliver Hart (Harvard Business School) and Luigi Zingales (The University of Chicago), recommend that shareholders should take a more pro-active role in defining the firm's social objectives by using their votes as shareholders (Hart & Zingales, 2017). Their recommendation supports the view that if Institutional Investors take social concerns and preferences of their ultimate beneficiaries seriously, they should engage actively with corporate management in defining social (and 'MindPrint' extended ESG) objectives of the firms they invest in.

1.4   The Moral and Legal Responsibilities of Companies and their Executives

Evidently, and as the above corporate practices on ESG reporting illustrate, Corporate Accountability 2.0 is making rapid progress. In academic research, a distinction is made between the descriptive, instrumental, normative and strategic approach to stakeholder management (Boesso, Kumar, & Michelon, 2013) – what is the basis for companies engaging in CSR activities and disclosures thereon. In practice, companies choose an approach that best fits the outcomes it aims to achieve from its CSR initiatives and stakeholder management.

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[21] MCSI is an independent provider of research-driven insights and tools for institutional investors: see https://www.msci.com/esg-investing
[22] See https://www.institutionalinvestor.com/article/b15cc1dxds8k97/mckinsey-esg-no-longer-niche-as-assets-soar-globally, accessed 30 March 2018.
[23] European Corporate Governance Institute, see: http://www.ecgi.org/wp/

There is however still substantial discussion on a more fundamental level, both in academia and corporate governance practice, about the moral responsibilities of companies and the fiduciary duties of their executives. There exists, for example, a deeply philosophical debate on the question as to whether corporations, being collective entities, can even be the bearers of moral responsibilities. This debate both advances and complicates the discussion with respect to a company's legal responsibilities, although the implications are certainly not straightforward or uncontroversial (Malzkorn, 2018; Rönnegard, 2015).[24]

Another, more widely held discussion in business ethics is that on the 'shareholder or stakeholder' question. Proponents of the so-called Anglo-Saxon model of capitalism take a 'shareholders first' position, arguing that the sole responsibility of a company is to maximize benefits for its shareholders. On the other hand, proponents of the European Rhineland model argue that a corporate license to operate is also dependent on, and should include, the consideration of stakeholder interests (Cohen & Peterson, 2017; Heath, 2014). The paper by Reynolds and Yuthas (2007) interprets traditional stakeholder theory differently; in their view, stakeholders should be considered as external parties that need to be managed and implicitly have a social contract with a corporation. Under this paradigm the relationship between corporations and stakeholders is considered to be integral to corporate reputation management and stakeholder performance management issues.

Fueled by the fundamental differences in shareholder and stakeholder theory, regulators have been struggling with identifying the primary users of corporate reporting: just existing shareholders or also stakeholders more broadly. To the degree that certain positions in these ethical debates result in social norms that form an impediment to companies taking responsibility for their ESG performance (Rönnegard & Smith, 2016), they could also be an impediment to the implementation of the more extended form of Corporate Accountability 3.0 proposed by the MindPrint project.

However, the immediate necessity to deal with these complex and continuing moral debates is reduced if one focuses on stimulating corporate accountability for ESG issues through institutional investors, which have – as mentioned before – a societal mandate beyond profit that more easily justifies or even requires (by law) taking ESG issues into account. In addition, new insights on the materiality of at least certain ESG and other business operation factors

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[24] Compare this to the debate on the existence of freedom of will and its implications for the possibility to hold humans morally responsible for their actions. Here as well it is not straightforward and uncontroversial what for our laws and social practices with regard to personal accountability.

reduce the tension in practice between taking the interest of stakeholders into account and acting in the best interests of shareholders. As Levy, Szejnwald Brown, and de Jong (2010) point out: the logic of "civil regulation" considers ESG reporting as "a mechanism to empower civil society to play a more active and assertive role in corporate governance". The logic of "corporate social performance," however, focusses on the instrumental value of social reporting in setting ESG objectives for corporate executives and provides information that assists investors, both private and institutional, in making investment decisions. Institutional Investors in particular are not only aligning their investment beliefs and values in constructing investment portfolios, they also explicitly consider longer term financial, and non-financial value contributions that high ESG ranking companies are able to achieve.

Developments in the law are starting to reflect new insights on responsibility and materiality in at least some countries and geographical areas. Already, in the European Union, institutional investors do need to take sustainability and ESG policies into account when developing investment policies.[25] The European Directive on nonfinancial and diversity disclosure came into force in December 2014. To improve the disclosure of non-financial information, it stipulates that certain large corporations should prepare non-financial statements with information on: environmental, social, employee-related, anti-corruption and bribery matters, respect for human rights, and diversity issues.

The American Bar Association Sustainable Development Task Force[26], in cooperation with Harvard (Eccles), Freshfields and other leading law firms, show that the stakeholder / shareholder debate in the USA is shifting towards a more balanced and stakeholder inclusive view. Yet, legal debates (in court and amongst scholars) on corporate legal liability versus corporate moral responsibility, and the fiduciary duties of executives, are expected to continue. In the foreseeable future differences will also remain between Europe, the US and other parts of the world (such as China and India) in how the law deals with the stakeholder versus shareholder issue on both financial and non-financial issues (Lombard & Joubert, 2014).

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[25] https://www.ipe.com/news/esg/eu-considering-sustainable-investing-as-fiduciary-duty-for-investors/10021736.article
[26] https://www.americanbar.org/groups/leadership/office_of_the_president-old/sustainable_development_task_force.html

2. Corporate Accountability 3.0: Agency, Well-Being & Responsible Innovation

2.1 From Good Corporate Governance to Managing Responsible Innovation

ESG guidelines, standards and measurements mostly concern the governance of a company as a whole (such as its board composition), and its overall environmental and social impact (such as carbon emissions and labour standards). However, in our current technological age, we argue, this traditional approach to ESG responsibility is no longer adequate. The growing interaction between - and convergence of - nanotechnology, biotechnology, information technology and cognitive technology is leading to accelerated societal changes as their applications enter the market. These technologies lead to unprecedented opportunities, but also new dangers or challenges for not just our quality of life as an outcome, but also our ability as humans to shape our life in ways we have reason to value. Technologies are increasingly "intimate", pervading and co-shaping our humanity and all aspects of our personal lives. Technology is, as Van Est (2014) puts it, increasingly "in us [e.g. biomedical devices], between us [e.g. social media], about us [e.g. big data] and just like us [e.g. artificial intelligence]." Companies, through their products and services, thus deeply influence our human capabilities and well-being.

This "progressive entanglement of intimate technologies and the life world," says Swierstra (2017, p.9), "has led to new demands that research and innovation extends its responsiveness to impacts on the good life and on the good society." According to him this is one of the reasons why the concept of Responsible Innovation (RI) or Responsible Research and Innovation (RRI) has gained momentum in the last decade. This is for example illustrated by various books which have appeared on the topic (Asveld et al., 2017; Koops, Oosterlaken, Romijn, Swierstra, & van den Hoven, 2015; Owen, Bessant, & Heintz, 2013), the recent special issue of the journal *Sustainability* on responsible innovation in industry[27], the establishment of the *Journal of Responsible Innovation* (Guston et al., 2014), and the prominent place that the topic has in the Horizon 2020 research program of the EU.[28] In the USA the National Science Foundation has supported the establishment of the Virtual Institute for Responsible Innovation.[29]

Responsible innovation can, according to an influential article (Stilgoe, Owen, & Macnaghten, 2013), be characterized by (1) a pro-active attitude towards the possible consequences of new

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[27] http://www.mdpi.com/journal/sustainability/special_issues/RRI
[28] https://ec.europa.eu/programmes/horizon2020/en/h2020-section/responsible-research-innovation
[29] https://cns.asu.edu/viri

technologies, (2) the inclusion of stakeholders already in the early phases of the innovation process, (3) reflexivity (fuelled by interdisciplinary research, including the humanities) and (4) responsiveness to societal needs and new insights (shown among others by valorising findings by translating them in design requirements). The last is facilitated among others by a growing body of literature on 'design for values' or 'value sensitive design' (Van den Hoven, Van de Poel, & Vermaas, 2015) as a way to realize responsible innovation.

What Responsible Innovation means in a business context and how it can/should extend existing CSR practices is still under discussion and investigation (Iatridis & Schroeder, 2016; Lubberink, Blok, van Ophem, & Omta, 2017). Efforts to measure responsible innovation, which are of course important for realizing Corporate Accountability 3.0 as we envisage it, are also still in their early stages (Spaapen et al., 2015; Van de Poel et al., 2017). We hypothesize, and reason in line with earlier research by (Khan et al., 2016) and (R. G. K. Eccles, Michael P.; Rogers, Jean; Serafeim, George, 2012) that companies that show transparency on their material 'intangible impacts and assessments' during the innovation process, and account for their considerations with regard to human agency and well-being, could have a 'human relevance' premium that can also provide the basis for positive (extended) ESG correlation with their (financial) performance.

Much work thus remains to be done on responsible innovation (more on this in the next chapter), and the MindPrint project will contribute to advancing this emerging field by connecting it to the debate on corporate accountability. One of the core propositions of the MindPrint project is that Institutional Investors should not just demand transparency from corporate executives on the overall governance of the company, but also on if/how responsible innovation is implemented and more specifically, how new products / services / business practices either contribute to human flourishing or constitute certain threats to human wellbeing and agency (and other relevant values).

2.2 Examples of Research on the Impact of New Technologies

Table 2 illustrates the need for Corporate Accountability 3.0 by listing almost 50 technology-driven companies that affect, through their innovations, the realization of a range of human capabilities and values (ranging from privacy to justice) in a range of technological domains (from robotics to big data). It is not our intention to give a complete overview here, nor do we structure the examples yet in a well thought-through theoretical framework that can guide Corporate Accountability 3.0. All we mean to do at this point is show the relevance, urgency and importance of rethinking Corporate Accountability 2.0.

	Robotics	Internet of Things	Biometrics	Persuasive Technology	Digital Platforms	Augmented Reality	Artificial Intelligence & Big Data
Privacy	Google Home	PROGRESSIVE	Withings	fitbit	(Snapchat)	GLASS	(Google Maps)
Autonomy	Care-O-bot 4	Apple	touch bionics	EBATES	facebook Ads	(AR)	(trend graph)
Security	RSU	amazon key	23andMe	D.	airbnb	GO	IBM
Control	da Vinci Si SURGICAL SYSTEM	nest	ancestryDNA	Google	(Uber)	(building)	70 NEWS
Power	GENERAL ATOMICS	TESLA	AADHAAR	KASPERSKY lab	(Twitter)	Microsoft HoloLens	(NSA seal)
Human Dignity	paro therapeutic robot	NAKED	23andMe	facebook	tinder	SECOND LIFE	(#)
Justice	GENERAL ROBOTICS	halo neuroscience	GARDASIL	Ads	SeekingArrangement	PROXIMIE	Social Intelligence

Table 2 - Examples of Values at Stake in the Technologies Developed by Various Companies[30]

In general, new technologies raise, contrary to what the table seems to suggest, social and ethical questions related to more than one value. Research on just a couple of cells from the table includes the following:

- Robotic surgical assistants as developed by Da Vinci Surgery and other companies have raised social and ethical questions with regard to patient safety, informed consent (in order to respect autonomy), and legal responsibility (Ferrarese et al., 2016; Strong et al., 2014; Tzafestas, 2016).
- A review of the literature on smart glasses (Hofmann, Haustein, & Landeweerd, 2017), developed by Google and others, identified a wide range of ethical issues "such as issues related to privacy, safety, justice, change in human agency, accountability, responsibility, social interaction, power and ideology."
- Tinder and other dating apps have raised social and ethical questions concerning privacy (Albury, Burgess, Light, Race, & Wilken, 2017), authenticity (Duguay, 2017) and intimacy (David & Cambre, 2016).

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[30] Axes of this table originate from a report on the digitized society by Kool, Timmer, Royakkers, and Van Est (2017), as adapted for MindPrint by Anna Eckhoff (see Acknowledgments)

- A comprehensive research meta-study identified some 400 articles on Facebook (Wilson, Gosling, & Graham, 2012), including articles on "identity presentation, the role of Facebook in social interactions, and privacy and information disclosure."
- An article in *Science* (Sparrow, Liu, & Wegner, 2011) studies the link between Google usage and human memory recall capacities. The article '*The Brain in Your Pocket'* (Barr, Pennycook, Stolz, & Fugelsang, 2015) studies whether smart phones supplant analytic thinking. They raise questions about human capacities and agency and how we should value these.

Of course, this is not to say that there is always agreement on the occurrence of certain impacts. For example in her book *Mind Change* neuroscientist Susan Greenfield (2015) argues - very condensed - that the intensive usage of screen technologies by children and young adults have a negative impact on the physical/neurological characteristics of the brain that could cause autistic-like traits. The book has generated a lot of public attention (Greenfield is in the House of Lords in the UK), but has also received significant criticisms from researchers on the scientific evidence for her claims (Bell, Bishop, & Przybylski, 2015; Davies, 2016). Often it is not (just) the occurrence of certain impacts that is contested, but (also) how they should be valued and who is responsible. These are challenges for the movement of Responsible Innovation and also for the MindPrint project – more on such challenges in the next chapter. However, these challenges should not be a reason to be indifferent on the potential difficulties of identifying and measuring material non-traditional ESG issues. In fact, the great variety of academic fields dealing with threats to human well-being and flourishing are considered an important stimulus to the development of the MindPrint concept.

2.3   Widening the Scope to Include the Intangible Impacts of Technologies

MindPrint's proposal for Corporate Accountability 3.0 does not entail merely a shift from 'good corporate governance' to 'responsible innovation management', but also a *widening* of the type of concerns that businesses should take into account. A distinction between the "hard" and the "soft" impacts of technology in recent work by Swierstra, a philosopher of technology and active participant in the Responsible Innovation community, is helpful to clarify this – although we prefer to refer to it as a distinction between the "tangible" and the "intangible" impacts of technology. The previous section already included examples of both tangible and intangible concerns.

What makes certain concerns "hard" or tangible, Swierstra and Te Molder (2012) argue, is that (a) it is quite uncontroversial that negative impacts with respect to these concerns or values

count as harm to the person, (b) this harm is relatively easy to quantify, and (c) there is a clear causal link between technology and impact. Typical hard concerns are health, safety, economic growth, employment and increasingly also sustainability. Given the aforementioned three characteristics it is no coincidence, we pose, that these 'hard' or tangible concerns are exactly the sort of concerns that are also central in ESG reporting or CSR 2.0. Companies and investors are indeed often already considering the ESG-consequences of the technologies that they use or produce, such as threats to employee health, consumer safety, and the environment.

More "soft" or intangible concerns concerning autonomy, identity, virtues, and so on are, on the other hand: (a) generally contested, as they are connected to different views of the good life, (b) more qualitative in nature and (c) not just the result of the technologies in question, but also of how people interact with them in socio-technical practices. As examples of soft impacts Swierstra (2015) mentions the claims that the internet undermines our intellectual virtues (Carr, 2011) and that Facebook comes at the expense of true friendship (Turkle, 2010). These types of impacts were already mentioned as examples in the previous section and are the 'corporate impact' factors that MindPrint wishes to include in Corporate Accountability 3.0.

What is worth mentioning is that Swierstra and Te Molder (2012) argue that the distinction between 'hard' and 'soft' impacts is not set in stone. It can be contested, is possibly culture and country dependent and will be developing dynamically throughout time. The two authors mention for example that (p.1060) "risks to our privacy are […] hard to quantify", but also that it is increasingly included in risk and technology assessments, along with hard impacts such as health and security. Indeed, privacy has become so accepted as a core value that it cannot be ignored, and as a consequence it was already included by the CFA Institute (2015) in their overview of ESG-concerns (see table 1 in chapter 1). The MindPrint project will address the challenges of turning more soft impacts into hard impacts by: a) getting more clarity on causal contributions of corporate products/services to human flourishing and well-being, and b) defining a framework of soft-impact measures and their control and reporting principles.

One reason to ask for more attention for technology's soft impacts, is the affluence of Western societies. Now that our basic needs have been met and the greatest threats of immediate physical harm are under control, we have space to pay attention to needs that are "more aspirational, geared towards human flourishing" (p.8). However, currently ESG-guidelines and standards – such as the UN Global Compact and the Corporate Human Rights Benchmark - do not reflect these more sophisticated aspects of being human; these standards are still largely geared towards more basic problems and needs.

2.4 The Capability Approach and Positive Psychology

Given that human aspirations and flourishing – or the related concepts of agency and well-being - are so central to the MindPrint project, it is useful to refer to some of the core concepts of these topics. Positive psychology and the Capability Approach are the two bodies of literature that we consider fundamental in developing an architecture for corporate reporting on human well-being.

The capability approach to well-being or quality of life has influenced various academic fields and application domains. Political philosophy and political economics theorize on and utilize the capabilities approach in assessing how countries perform in looking after the 'human interests' of their citizens' – this is in addition to the traditional economic measure of GDP as prime indicator of human well-being. It proposes to assess this well-being or quality of life in terms of valuable individual capabilities, or the real/positive freedoms that people need to achieve valuable 'beings and doings' or 'functionings'. Both internal factors (skills, bodily capabilities, health characteristics, etc.) and external (income, education, political and religious institutions, etc.) to the person are considered important as capability inputs. In addition to well-being, agency is a key value in the capability approach literature; creating capabilities means empowering people to realize a life they have reason to value. Economist and Nobel prize winner Amartya Sen (1985, 1999) and philosopher Martha Nussbaum (2006, 2011) are widely regarded as the founders of this approach. The latter has defined a list of basic (categories of) human capabilities that she considers to be essential for human dignity: (1) life, (2) bodily health, (3) bodily integrity, (4) senses, imagination and thought, (5) emotions, (6) practical reason, (7) affiliation, (8) other species, (9) play and (10) control over one's environment.

In the 1990's positive psychology arose as a response to dissatisfaction with the focus of traditional psychology on mental health problems and how to solve them. Positive psychology instead focuses on the conditions needed for the mental flourishing of people, or subjective well-being. Researchers in this field investigate (a combination of) various constructs: hedonic pleasure and other positive mental states (like flow), people's satisfaction with life as a whole or with specific spheres of life, and happiness. Some of the more well-known scholars in this field are Mihaly Csikszentmihalyi (1991), Ed Diener (2009)[31], Daniel Kahneman (1999)[32] and Martin Seligman (2012). Just as capability scholars, several positive psychologists have made a plea for changing the way how we assess the success of economic policies and national

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[31] Co-authored with Richard Lucas, Ulrich Schimmack, and John Helliwell.
[32] Co-edited with Ed Diener and Norbert Schwarz.

welfare. Agency has also received attention in positive psychology, in particular the related concepts of autonomy and self-determination (e.g. Ryan & Deci, 2006).

Although these two theoretical and practice domains can be seen as competing approaches to human well-being, and indeed are treated as such in philosophical debates on the best theory of well-being, it is also possible to emphasize the similarities that these approaches share and explore ways to integrate them (Jayawickreme & Pawelski, 2013). The MindPrint project takes a pragmatic position in these debates, by considering these two approaches in principle as complementary and in utilizing the opportunity that they may each be suitable for different contexts and applications. The next chapter will expand and discuss the application to technology and innovation in some more detail.

2.5   To Conclude This Chapter

It is both important and urgent that the more intangible impacts of technology and related corporate practices are being addressed by companies, given that the growth in 'intimate' technologies increasingly leads to products, services and systems that potentially affect human flourishing. It is also in line with the changing public sentiment on the responsibilities of companies, as was already mentioned in the introduction.

In taking up this challenge, the MindPrint project will not restrict the concept of Accountability 3.0 to innovative technology and products/services only; also, the (hard/soft) impact of associated distribution, communication and marketing practices will be taken into account. Responsible innovation is needed to make sure that they satisfy more advanced human needs and respect more intangible values than merely health, safety and sustainability.

Obviously, the three characteristics of soft or intangible impacts mentioned earlier (Swierstra) also pose challenges for promoting and measuring responsible innovation in this wider sense, and thus also for realizing Corporate Accountability 3.0. The next chapter will briefly address these and some further theoretical and practical challenges that one faces when implementing (accountability for) responsible innovation. We will also discuss to what extent responsible innovation indicators already exist.

3. Managing and Measuring Responsible Innovation – Challenges and State of Affairs

3.1 Challenges in Addressing the (Intangible) Impacts of Innovations

A major challenge for managing responsible research and innovation is *temporality.* Spaapen et al. (2015) point out "it may take up to 15 years before a research idea materializes in some kind of application." During this development period innovators moreover face the so-called *Collingridge dilemma*. It has been extensively referred to in various literatures – like science and technology studies (STS) and philosophy of technology (PoT) - since it was first formulated in 1980 by David Collingridge. The dilemma is – put very simply - that in the early phases of the innovation process important decisions are made on shaping the new technology that influence its societal impact, and/or the effects on human functioning and well-being. At that moment these decisions can still be changed easily and at low costs. However, it is hard to predict the (hard and soft) societal impacts of new technologies in their early stages of development. In the later phases of the innovation process it is the other way around: it becomes increasingly clear what the societal impacts are but making changes in the technology becomes increasingly difficult and costly.

The Collingridge dilemma[33] points out why responsible innovation is not easy, but it could equally well be argued that it makes it clear why it is nevertheless important for companies to extend their current CSR efforts to include responsible innovation: "Changing the product at later phases of the product development", Van de Poel et al. (2017) note, "is likely to induce higher development costs, and delay the innovation process and eventually market entry". The fate of Google Glass, mentioned in the previous chapter, is an example in case. Companies thus need to balance, they argue, foreseeability and the cost of additional changes. Van de Poel et al. refer to some case studies that indicate that responsible innovation "may have clear advantages for companies and contribute to competitive advantage" (see e.g. also Flipse, van der Sanden, & Osseweijer, 2014). However, clearly more work needs to be done to address corporate leadership implications and to assess the benefits and challenges of responsible innovation.

A key challenge for the MindPrint project will therefore be to determine how companies could include product/service design and delivery considerations that address soft (or intangible) impacts early on in the development process, in particular assessments of impacts on human

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[33] A full and systematic critical analysis of the Collingridge dilemma and its implications for responsible innovation can be found in a recent paper by Genus and Stirling (2018).

agency and well-being. Obviously, the 'materiality' concept discussed earlier (see §1.3), should provide guidance on the range of risks/rewards indicators of responsible innovation that needs to be considered.

Furthermore, *indeterminacy and therefore attribution of responsibility,* is another challenge. "Impact", Spaapen et al. (2015, p.12) note, "is the result of a network of interactions between a variety of stakeholders", not just of the actions of innovating firms. Technology's impacts are, Swierstra (p.15) argues along the same lines, "co-shaped by how actors decide to respond to the invitations, nudges or provocations that emerging technologies bring." It is thus hard to hold any single actor responsible for the end result. This challenge for the assignment of moral responsibility for the impact of technologies is referred to as the "problem of many hands" by philosophers of technology (Noorman, 2012). This issue of 'many hands' is a backward-looking attribution of responsibilities. It adds an additional dimension to the questions about corporate responsibility that were already raised in §1.4 and could have comparable moral implications for 'nudging' techniques and the so-called 'choice architecture' of product/service design, that are principally 'forward-looking' (R. H. S. Thaler, Cass R., 2008; R. H. S. Thaler, Cass R.; Balz, John P., 2013) . However, a certain consensus has also grown in the academic literature – supporting the proposition of the MindPrint project - that technological artefacts are not just value-neutral instruments, but in certain senses inherently normative or value-laden (Radder, 2009; Van de Poel & Kroes, 2014), and therefore companies can and should bear at least some responsibility for the contribution that they make to the (intangible) impacts of the technologies they introduce.

Taking the more soft or intangible impacts of technologies into account, which companies should do according to the MindPrint project during their innovation endeavours, raises a number of further challenges (Swierstra, 2015). One is the challenge of *moral ambiguity*. In the case of soft or intangible impacts there is no societal agreement on whether the impact is good. "This ambiguity can be the result of conflicting values", says Swierstra (p.10), but in the case of intimate technologies "it is caused by the destabilization of the normative and moral routines that we rely on to assess the (un)desirability of the impacts of those technologies." The introduction of the anti-conception pill, for example, led to a change in morality that affected how that very pill was judged.

Another challenge is *technology's incorporation in value-laden human practices*. Soft impacts concern changes, Swierstra (p.12) argues, in our socio-technical-moral practices; new technologies change – for example - how we nurse, teach, raise children, maintain friendships or manage ourselves. In these cases, our "moral know-how exists in the form of embodied

knowledge, of tacit understanding, tightly linked to our emotions." If we want to reflect on the ethical desirability of possible changes in such practices, we need to make the values embedded in such practices visible by explicating them. This requires, says Swierstra, "thick descriptions or narratives" – so taking a qualitative rather than a quantitative approach. Knowledge and experience from the 'humanities' should be used as a compass, pointing to solution directions. It requires, however, integrating the humanities and technology development in new ways (see e.g. Peter Paul Verbeek, 2010).

3.2 Tools and Approaches Available for Innovators

The challenges mentioned in the previous section should not defeat us; they do not make it impossible to pro-actively take responsibility for the (intangible) impacts of innovations. Swierstra argues for example that innovators can use tools such as the creation vignettes and scenarios (Lucivero, Swierstra, & Boenink, 2011) to anticipate the (intangible) impacts of new technologies on valuable human practices. Such exercises should draw on knowledge and insights from both the humanities and social sciences. An example is the philosophy of technological mediation (Peter Paul Verbeek, 2005), which explores how our perception of possibilities of actions in, and relationship toward the world, is mediated by technical artefacts.

A number of recent articles have made an inventory of the many approaches, methods and tools that are currently available for organizations that want to engage in responsible innovation (Reijers et al., 2017; Stilgoe et al., 2013; Van de Poel et al., 2017, see appendix A). The latter two inventories are organized according to the four characteristics of responsible innovation that Stilgoe et al. (2013) introduced in their influential article: anticipation, inclusiveness, reflexivity and responsiveness (see chapter 2). The third overview (by Reijers et al.) distinguishes between three types of methods: 'ex ante' (early stages of innovation), 'intra' (design and testing phase) and 'ex post' (implementation phase). This overview is the result of a literature review covering the fields of philosophy/ethics, law/governance, science and technology studies (STS), technology assessment, foresight studies, responsible innovation and the 'ethical, social and legal aspects of new technologies' (ELSA). In addition to scenario studies, examples of items included in these three articles are embedding ethicists in the lab, ethical parallel research, technology assessment, consensus conferences, living labs, value sensitive design and stakeholder dialogues.

What these three articles illustrate is that there is already a substantial amount of knowledge on how to conduct responsible innovation, the challenges that come with it and how to address them. This provides strong encouragement that the time is right to start asking how, next to academia and government, also (more) companies can be moved to implement responsible

innovation techniques more often. These tools, methods and approaches should not be utilized for just 'window dressing' and/or reputation management purposes only, but should be employed foremost with the potential benefits for customer well-being in mind. The MindPrint project will need to address how companies can incorporate these various tools / methods / approaches of responsible innovation based on a corporate accountability framework and accompanying standards – the objectives of these standards include making these corporate efforts on responsible innovation: measurable, comparable, accountable and transparent.[34]

3.3 Positive Technology and Capability Sensitive Design

One thing that becomes clear in this literature on how to realize responsible innovation is the importance of interdisciplinary collaboration. Value sensitive design (Van den Hoven et al., 2015), for example, has been developed as a practice in which conceptual, technical and empirical investigations are being integrated throughout the innovation process. The reflection on what values matter and how these values should exactly be understood is an important part of the conceptual investigations (Friedman, Kahn, & Borning, 2002) – and here, quite obviously, humanities research is indispensable. The literatures on the capability approach and positive psychology, introduced in the last chapter as two influential understandings of human flourishing, each provide highly relevant knowledge and insights that could inform the responsible innovation process. Various studies have been published in recent years on their application to innovation, technology and design.

The Journal of Psychological Well-being, for example, published a special issue in 2016 on "positive computing." The editors of the issue speak of the need for a "new partnership between psychology, social sciences and technologists" in order to start designing interactive technologies with an "explicit focus on well-being" (Calvo, Vella-Brodrick, Desmet, & Ryan, 2016). The need for interdisciplinary collaboration is also discussed in other articles which explore the benefits and challenges of, and experiences with, "positive technology". Positive Technology is technology developed against the background of insights from positive psychology (Botella et al., 2012; Diefenbach, 2017; Gaggioli, Riva, Peters, & Calvo, 2017; Riva, Baños, Botella, Wiederhold, & Gaggioli, 2011). Pawlowski et al. (2015) even suggest that positive computing is "a new trend in business and information systems engineering." See also the book written by Calvo and Peters (2014).

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[34] Although an explicit distinction between hard/tangible and soft/intangible impacts is generally not explicitly made in before mentioned literature, it reasonable to expect that at least a part of the tools included in appendix A can in fact support taking soft impacts into account.

Although the first publication on the relevance of the capability approach for technology appeared as early as the 1990s (Garnham, 1997), the topic only recently started to get some academic traction. A special issue in the Journal of Ethics and Information Technology and an edited volume with Springer (Oosterlaken & Van den Hoven, 2011, 2012) show a growing interest from academics in various disciplines. Coeckelbergh (2011), for example, argues for the need for continuous hermeneutical reflection on the meaning of Nussbaum's capabilities as technological development progresses. Zheng and Stahl (2012) propose a 'critical capability approach of emerging ICTs'. In a book chapter Oosterlaken (2015) sketches the outlines of 'capability sensitive design' or 'design for capabilities.' And a recent book explores the relationship between privacy and human capabilities in "a world of ambient intelligence" (Costa, 2016).

Corporate initiatives also provide substantive support that the objectives of the MindPrint project are realistic and can be achieved. The following sample lists a number of companies that actively engage in employing the knowledge gained from 'Positive Technology' into responsible product/service development practices for human well-being:

- **Humanyze:** 'Humanyze applies behavioral science, organizational network analysis, and AI to help organizations make better decisions. Born out of the MIT Media Lab, we help companies measure corporate communication data to uncover patterns on how work gets done' – quoted from their website: https://www.humanyze.com
- **Affectiva:** 'Spun out of MIT Media Lab in 2009 and are backed by leading investors including Kleiner Perkins Caufield Byers, Horizon Ventures, Fenox Venture Capital and WPP' – quoted form the website: https://www.affectiva.com
- **Human Computer Confluence:** 'Human computer confluence refers to an invisible, implicit, embodied or even implanted interaction between humans and system components. New classes of user interfaces may evolve that make use of several sensors and are able to adapt their physical properties to the current situational context of users. Future of HCC towards Horizon 2020 and HC2 major research challenges: Extending Human Perception, Cognitive Prostheses, Empathy and Emotion, Wellbeing and Quality of Life, Socially Inspired Technical Systems and Value Sensitive Design' as quoted from the website: http://hcsquared.eu

More examples of companies embracing positive technologies and/or positive design concepts are included in Appendix E.

3.4 The Measurement of / Indicators for Responsible Innovation

In the past couple of years a number of reports resulting from EU projects have appeared on the topic of the measurement of and indicators for Responsible Innovation (Hin et al., 2014; Ravn, Nielsen, & Mejlgaard, 2015; Spaapen et al., 2015), also a number of articles were published in scientific journals (Van de Poel et al., 2017; Wickson & Carew, 2014). A returning observation in these publications is that, given the challenges mentioned at the beginning of this section, it is not always possible to focus directly on impacts and hold companies responsible for them. Therefore, it is proposed, the emphasis should be on "developing evaluative criteria for RRI as a *process*" (Wickson & Carew, 2014, p.7)[35] on "short- and medium-term effects/goals; on intermediate impacts", shifting the emphasis of impact evaluation "from (end) product to process, and from verdicts/judgments to learning and improving" (Spaapen et al., 2015, p.11/12). What is needed are "Key Performance Indicators (KPIs) that company managers can monitor to assess RRI progress" (Van de Poel et al., 2017, p.13).

Criteria areas	Performance indicators		Perception indicators	Key actors
	Process indicators	Outcome indicators		
Public engagement				
Gender equality				
Science education				
Open access				
Ethics				
Governance				
Social justice/inclusion				

Table 4 - Indicator framework for RRI developed by EU Expert Group[36]

Spaapen et al. (2015)[37] consider indicators for responsible research and innovation in eight criteria areas (table 4), distinguishing between process, outcome and perception indicators. The criteria areas correspond to policy priorities of the European Commission (European Union, 2012 and the Horizon 2020 programme). In addition, they argue, (p.10) "it makes sense to have the monitoring of the development of RRI agendas [itself] as a primary, overarching indicator", given that the concept is still very much under development. Their focus is on responsible innovation as a result of "the collaborative effort of actors in a network" (p.16) that needs to be managed and monitored. At least a part of the indicators that they propose within their framework (see table 4 and appendix B) do not seem directly relevant for holding

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[35] Although, the authors acknowledge, a sharp distinction between process ad products is not possible, therefore "in focusing on the evaluation of a *process* of innovation, one still needs the capacity to also consider existing *preconditions*, envisaged *products* and engaged *people*, since all of these elements shape, guide, and, to some extent, generate and characterize the RRI processes that the schema is primarily designed to evaluate."
[36] Source: Spaapen et al. (2015)
[37] More info on the research project behind this report: https://morri.netlify.com/

companies accountable, but are more geared towards other key actors, such as universities and governments. MindPrint, on the other hand, is focused on corporate accountability.

Organizational KPIs	Responsible Research and Innovation KPIs
Internal • Technology • Sales / marketing • Planning / management • Resources • Collaboration / communication *External* • Market • Customer / end-user	*Diversity and inclusion* • Gender equality • Engagement *Anticipation and reflection* • Legislative landscape • Assessment • Public and ethical issues *Responsiveness and adaptive change* *Openness and transparency* • Intellectual property and confidentiality • Open access *Environmental sustainability* *Social sustainability*

Table 5 – Categories of KPIs on Responsible Research and Innovation[38]

Van de Poel et al. (2017) are more focused on responsible innovation in firms. They report that they have distilled 92 relevant and non-redundant KPIs from the academic and grey literature on innovation management and on responsible innovation. These have been organized in a number of "themes relating to organizational R&D aspects [49 indicators] and specific RRI criteria [43 indicators], on both the product and the process level of innovation" (p.13, see table 5). These researchers have also taken steps towards turning these KPIs into a tool for self-assessment that will in the near future be tested in eight company cases.[39] They however remark that independent assessments may also be required, which "can be implemented in several ways, including external auditing, independent certification, or government oversight, each of which may have its advantages and drawbacks" (p.15).

Wickson and Carew (2014) have developed a RRI performance rubric (see appendix B) based on yet another list of salient topics for consideration, which – so they argue (p.8) - "unite demands from different communities [and literatures] concerning what 'good' science and 'responsible' research and innovation should entail". Appendix B contains more details on the details of the Wickson and Carrew RRI 'rubric'. One question that will be taken up by the MindPrint project is where the above 'innovation indicators' overlap with current ESG (or GRI) standards.

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[38] Source: Van de Poel et al. (2017). Unfortunately, the list of KPIs falling under each of these categories is not included in the paper. Probably the authors will reveal those in future publications.
[39] A quote from their article: "We then reformulated all these indicators into statements about R&D processes that people might agree or disagree with to a certain extent, in preparation for the later scoring of these elements on a 7-point Likert scale. An example of a statement under gender equality is '*The integration of gender dimensions is actively integrated in research and innovation outcomes*', and under public and ethical issues '*We document best practices about ethical acceptability for this type of project during its development*'" (p.13). Not all statements may, according to the researchers, be relevant to all company pilots, so for each case a selection will be made.

3.5 To Conclude This Chapter

This chapter has shown that responsible innovation is challenging, but certainly not impossible. A lot of tools, methods and approaches are already available for innovators and there is a growing body of literature - and to some extent corporate practices - that explores how human flourishing can be given a central place in the development and design of new technological systems, products and services. A starting point for the MindPrint project is the assumption that companies and their investors would benefit from greater transparency on responsible innovation and the related disclosures on how companies through their products/services affect human flourishing.

However, without an accountability framework and accompanying standards (to be promulgated by for example EU and/or SASB), corporations and institutional investors cannot measure, compare and design investment portfolios that take account of human well-being factors. MindPrint's core objective is therefore to extend corporate accountability practices and develop a framework that includes uniform standards, an assessment methodology and indicators of responsible innovation directed towards not only quantifying hard impacts, but in particular measuring soft impacts affecting human agency and well-being. Recent attempts to develop indicators for Responsible Research and Innovation provide a sound basis for the MindPrint project to build on but are not sufficiently geared towards the business accountability context, and/ or are not sufficiently developed to serve the information needs of investors.

4. Lessons for the MindPrint Project from Corporate Accountability 1.0 and 2.0

The ambition of project MindPrint is to develop a conceptual framework for standards on corporate accountability for human-well-being (Corporate Accountability 3.0); a framework and standards that address how companies and their products/services affect key factors of human well-being, agency, autonomy, self-directedness, privacy and other key values. Similar to other corporate accountability standards (financial and/or ESG), these new standards should both focus on corporate processes and practices - responsible and human values driven innovation and products/services delivery – as well as on corporate transparency in reporting material factors that affect the 'human' outcomes of innovation practices.

This chapter will discuss some key characteristics of financial reporting practices (Corporate Accountability 1.0) and ESG reporting processes (Corporate Accountability 2.0) that also seem relevant to the MindPrint project. For those readers not familiar with the field of corporate reporting and accountability: Appendix D contains a brief introduction to the most important organisations, frameworks and standards.

4.1   Financial Reporting Frameworks (Corporate Accountability 1.0)

Academics have written extensively on the history and development of accounting standards and the development of a framework for financial reporting (Zeff, 2013), on the characteristics of a useful framework (Ohlson et al., 2010), on financialization and the conceptual framework (Zhang & Andrew, 2014), on the pros and cons for investors of standards and how "accounting is shaped by economic and political forces" (Ball, 2006), on setting standards for a worldwide constituency (Camfferman & Zeff, 2017), and on many more issues. Of interest to the MindPrint project is that both financial and non-financial standard setting involves a wide variety of capital markets participants, including, securities regulators, accounting standard setters, the larger accounting firms, major corporations, financial analysts and institutional investors.

Financial reporting frameworks and standards are well established, except for some strategic direction issues (convergence, principal user, rule/principle based, complexity, and overload). In this section we will briefly introduce three of these issues, as they also seem to be of relevance to the development of corporate accountability 3.0:

a)   Information overload and complexity
b)   Principles versus rule-based standards

c) Decision usefulness versus stewardship

a) Information overload and complexity

Over time increased regulation by national and international authorities has resulted in a highly complex, multi-layered, multi-player process of financial standards development and promulgation. Since 1976 the American Generally Accepted Accounting Principles (GAAP), issued by the Financial Accounting Standards Board (FASB), have grown to more than 10,000 pages of rules - not even counting the publications of the Emerging Issues Task Force (EITF). In the meantime, the European International Accounting Standards Board (IASB) and its predecessor[40] have issued more than 2,500 pages of standards, currently documented as International Financial Reporting Standards (IFRS).[41] Yet even with this smaller number of pages, questions still arise in the European context on information overload and unmanageable complexity. According to a report by the FEA or Federation of European Accountants (2015)[42], called *The Future of Corporate Reporting – Creating the Dynamics for Change,* financial statements increasingly lose relevance because they are not timely, relevant information is buried in an information overload, their compilation is considered a mere compliance exercise and there are different reports for different users – so there is no uniform, integrative approach. To address such problems the FEA has launched the reform project 'Core & More.' This rule-complexity of financial accountability, combined with corporate reporting 'short-termism' and a share-based management reward system, has frequently resulted in so-called 'earnings management' practices that ended in financial reporting fraud and related 'financial statement restatements' (Gertsen 2009). Complexity of accounting standards has also been recognized by both regulators and practitioners as a cause of financial reporting errors and fraud, either intentionally or unintentionally[43]. If we want Corporate Accountability 3.0 to be a success, the MindPrint project will need to pay attention to preventing information overload and unnecessary complexity as well.

b) Principles or rules based standards

In academic discourse on accounting standards, and also in the public financial domain, it is often asserted that US GAAP is a comprehensive rule-based system, while IFRS is predominantly 'principles' based. In addition, it is argued that the litigious culture in the US and

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[40] the International Accounting Standards Committee (IASC)

[41] previously known as International Accounting Standards

[42] The FEE represents 47 professional institutes of accountants and auditors from 36 European countries, with combined membership of over 800,000 professionals working e.g. as preparers, auditors, analysts and practicing accountants.

[43] For a speech by SEC Chairman Cox (2005) addressing complexity see: https://www.sec.gov/news/speech/spch120505cc.htm

the consequential focus on public accountants' professional liability can be seen as a root cause for the extensive rule-based system of US financial reporting. However, US GAAP also includes a solid principles-based framework – the FASB's 'Statements of Financial Accounting Concepts'. Recent discussions on financial reporting in the United States include implicit or explicit recommendations to abandon this rules-based system in favor of a principles-based system comparable to those applied under IFRS.[44] Proponents of a principles-based system expect that some or all of the current difficulties facing American financial reporting would be alleviated or even eliminated by such a shift. The main problem is that the current rule-based financial reporting system, and its 'bright-line' accounting standards in the US are said to foster a "check-the-box" or compliance mentality that is, in the view of some, an open invitation to financial structuring and other activities that subvert high quality financial reporting. Moving to a principles-based system would be desirable, because such a system would allow for (or require) the appropriate exercise of professional judgment. These considerations have been part of the so-called convergence project between US GAAP and IFRS – a project that started in 2010 and was abandoned in 2014. For the MindPrint project it is a fundamental choice whether to shape Corporate Accountability 3.0 more along the lines of rules or principles.

c) Decision usefulness versus stewardship

According to the 'efficient market hypothesis' (Cauwenberge & Beelde, 2007) "the objective of general purpose external financial reporting is to provide information that is useful to present and potential investors and creditors and others in making investment, credit and similar resource allocation decisions." This is referred to as 'decision usefulness.' Lennard (2007) argues however that exclusive focus on decision usefulness has led to an excessive emphasis on the forecasting of future cash flows and insufficient emphasis on management reliability. According to Lennard good stewardship should be recognized as a separate objective in financial reporting, in order to make the contribution of management to strategic corporate performance more transparent.

The IASB has rejected the stewardship argument, taking the position that (a) information about management's stewardship is part of the information used to make decisions about whether to buy, sell or hold an investment[45] and (b) introducing an additional primary objective of financial reporting could be confusing (T. Murphy, O'Connell, & Ó hÓgartaigh, 2013). However, the IASB is sending different messages: the idea of stewardship is sometimes also combined

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[44] For example, Section 108 of the Sarbanes-Oxley Act of 2002 instructs the Securities and Exchange Commission (SEC) to conduct a study on the adoption of a principles-based accounting system.
[45] For example, information about stewardship would inform a decision to hold an investment (and perhaps improve management) instead of selling it.

with a stakeholder viewpoint, with the IASB (2010a, para. OB12) stating that non-capital providers (such as employees, regulators and management) will also be interested in "how governance is discharged and how effective management has been." For example, employees' and management remuneration can depend on General Purpose Financial Report (GPFR) disclosures.

It has been argued (Ravenscroft & Williams, 2009; Young, 2006) that it fits the neoliberal agenda to install 'decision usefulness' from an investor/creditor perspective as the sole accounting objective, and that the stewardship concept has the potential to lead contemporary accounting into realms far removed from its accountability origins. Fortunately, as will be discussed in the next sections on ESG reporting frameworks, the managerial stewardship discussion gained new traction: the concept of managerial stewardship should not be limited to a responsibility for 'corporate financial assets' only, but should be extended to those assets that are affected, directly or indirectly, by corporate products/services processes. The impact corporations have on other capital assets such as: employees, consumers and other stakeholders, Integrated Reporting, discussed in the next section in some more detail, is the reporting framework that includes accountability and value considerations of these 'other' capitals employed by corporations. It makes sense for the MindPrint project to take stewardship explicitly into account in the further development of Corporate Accountability 3.0. In addition, we believe that if companies can report their contributions on stewardship for human well-being, based on a uniform reporting framework, these companies will be able to positively distinguish themselves in capital markets and also enhance their reputation with consumers and other stakeholders.

4.2 Non-Financial / ESG Reporting Frameworks (Corporate Accountability 2.0)

Academics have also written extensively on frameworks and the development of standards for non-financial reporting – a small, illustrative selection includes: on determinants of Corporate Social Responsibility (Huang & Watson, 2015); on the development of a 'general set' of CSR indicators (Rahdari & Anvary Rostamy, 2015); on gaps in the Integrated Reporting Framework (de Villiers, Charl de Villiers, Rinaldi, & Unerman, 2014); on what companies do to stay in the Dow Jones Sustainability Index (Searcy & Elkhawas, 2012). At this point, we will discuss three issues of ESG reporting that we consider of particular relevance to the MindPrint project, as follows:

a) Proliferation of standards and data
b) Lack of a shared theoretical basis
c) Skepticism and 'CSR washing'

a) Proliferation of standards and data

The field of ESG shows a proliferation of standards, data firms and methodologies, leading to confusion, non-involvement and paralysis - see the *Rate the Raters* report by SustainAbility (2018). Collecting high-quality data for an integrated report is a never-ending and time-consuming process. The information reported under Integrated Reporting is both historical and future oriented, making the sources more expansive than traditional historical metrics. The Global Reporting Initiative (GRI) was created by an assemblage of parties that all strived to set up a framework for non-financial reporting in the 1990's. Included in this multi-stakeholder initiative were some of the largest MNC's, the big accounting and consulting firms, securities regulators and a number of NGO's. The GRI still competes with other standards on non-financial information that are mainly sector-specific. This proliferation of standards on non-financial reporting, inclusive of ESG, has made it difficult to compare companies on their performance metrics. As a result, capital market participants, and in particular main stream financial analysts (both buy and sell side), have been reluctant to include non-financial data in their company assessments and/or ratings. However, in recent years, mainly due to the requirements of institutional investors, the ESG data collection business has proliferated. In this regard, GRI has fallen short of its intent to be the sole non-financial information standard setter. The MindPrint project faces the same challenges as the Global Reporting Initiative and more research is needed on how they can best be addressed. Seeking cooperation with the largest Institutional Investors, the leading accounting firms and prominent ESG standard setters will need to be considered as well.

b) Lack of a shared theoretical basis

What does not help, is that a shared theoretical basis on ESG accountability is missing according to Schwartz and Carroll (2008):

> "In the field of business and society, several complementary frameworks appear to be in competition for preeminence. Although debatable, the primary contenders appear to include (a) corporate social responsibility, (b) business ethics, (c) stakeholder management, (d) sustainability, and (e) corporate citizenship. Despite the prevalence of the five frameworks, difficulties remain in understanding what each construct really means, or should mean, and how each might relate to the others." (p.148)

Their solution is "to propose three core concepts—value, balance, and accountability—that might be used to better integrate the five frameworks and potentially provide the basis for further discussion and theoretical development of the business and society field." An important

next step in the MindPrint project is to find out and analyze what progress has been made in the last decennium in integrating different theoretical frameworks on ESG accountability. If the theoretical field remains divided, it may be necessary to make a pragmatic choice on how to best position the MindPrint project.

c) Skepticism and 'CSR washing'

Popular press and scholars alike have expressed reservations about the true impact of corporate social initiatives, noting that existing CSR practices and processes, "have little to do with extending accountability and amount to nothing more than exercise in stakeholder management and corporate spin**"** (Boesso et al., 2013). Many consumers, activists, and academics believe that a multitude of companies are profiting from insincere claims of corporate social responsibility. Capturing this view, increasingly, is the expression that many companies are ''CSR-washing.''[46] Although not all scholars agree that this is a serious problem (see e.g. Pope & Wæraas, 2016), it is still something to pay attention to for the MindPrint project. What needs to be avoided is that responsible innovation does not become more than another 'corporate spin' to business as usual. According to Williams (2016):

> "What evidence there is of the power of non-financial disclosure is consistent with what we've seen in the financial disclosure arena: to have operational effects, disclosure must be mandatory (so that disclosers cannot be selective in what they disclose), specific, and targeted to clearly identified users."

The core philosophy of ESG reporting, Integrated Reporting and in particular the MindPrint project is that companies that measure the values they create in various 'capitals', not just restricted to financial capital, but extended to 'capitals' of employees, consumers, the environment, will also be able to manage these capitals in the most productive (valuable) manner. By 'managing what can be measured' these companies will be able to contribute value, not only to shareholders but simultaneously to consumers' human well-being and to society at large.

4.3   In Conclusion and some Next Steps

In a next paper we will focus on the theoretical and practical measurement aspects of the concepts included in corporate accountability 3. 0.. In addition, based on field research, we will elicit the opinions from 'Activist CEO's' that have already shown in corporate practice to take their extended ESG corporate responsibilities seriously.

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[46] https://www.cbsnews.com/news/csr-washing-is-the-new-greenwashing/ (accessed 15 April 2018)

Some of our next steps will include:

1. Follow-up on MindPrint Foundations Paper
   a. Engage academics from the Stevanovich Institute on the Formation of Knowledge, from the University of Chicago and from the Booth School of Business, and obtain comments on the theoretical underpinnings of this Foundations Paper
   b. Invite and engage academics from Delft University of Technology, University of Twente and other European (and/or international) Technology Institutes to validate the potential of Positive Technology and Value-Sensitive Design as a theoretical foundation for the MindPrint concept.
   c. Engage and involve 'activist CEO's' in the activities of the MindPrint project and obtain their cooperation to fund a number of case studies

2. Mobilize Institutional Investors, the Big4 Accounting Firms, ESG Data Consulting Firms and Stakeholder Organizations
   a. Develop standards and measures for a 'Framework for Human Well-Being Accountability' that focuses on the hard/soft impacts of products/services on human well-being and core human capabilities; these efforts will need support from those parties that traditionally have been involved with 'classic' ESG considerations and their measurements and are willing to extend the scope of their work towards the more intangible (soft) impacts of products/services.
   b. Case studies will need to be elicited from current corporate practices that illustrate the advantages and challenges of positive technology design and implementation for customers and investors (see Appendix E for an initial reconnaissance effort).
   c. Consider designing an Investment Portfolio that includes both high and low performing companies on the MindPrint axes of measurement

3. Investigate and obtain funding for the next phase in developing a theoretical and practical Framework for Human Well-Being Accountability

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Appendix A – Methods and Tools for Responsible Innovation

Tools for companies to use in the process of responsible research and innovation

Source: Van de Poel et al. (2017)

RRI Dimension	Possible Tools
Anticipation	Scenario building Scenario workshops Foresight studies Technology assessment Life cycle assessment
Inclusiveness	Stakeholder mapping Stakeholder engagement strategies Stakeholder dialogues Public dialogues User-centered design
Reflexivity	Codes of conduct Core values Embedded ethicists
Responsiveness to values and needs	Value sensitive design Stage-gate approaches Sustainable design
Responsiveness to new developments	Monitoring Gradual scaling-up Adaptive risk management Living labs and social experimentation Flexible and adaptive design

Techniques and approaches to be used in the process of responsible innovation

Source: Stilgoe et al. (2013)

Dimension	Indicative techniques and approaches	Factors affecting implementation
Anticipation	Foresight Technology assessment Horizon scanning Scenarios Vision assessment Socio-literary techniques	Engaging with existing imaginaries Participation rather than prediction Plausibility Investment in scenario-building Scientific autonomy and reluctance to anticipate
Reflexivity	Multidisciplinary collaboration and training Embedded social scientists and ethicists in laboratories Ethical technology assessment Codes of conduct Moratoriums	Rethinking moral division of labour Enlarging or redefining role responsibilities Reflexive capacity among scientists and within institutions Connections made between research practice and governance
Inclusion	Consensus conferences Citizens' juries and panels Focus groups Science shops Deliberative mapping Deliberative polling Lay membership of expert bodies User-centred design Open innovation	Questionable legitimacy of deliberative exercises Need for clarity about, purposes of and motivation for dialogue Deliberation on framing assumptions Ability to consider power imbalances Ability to interrogate the social and ethical stakes associated with new science and technology Quality of dialogue as a learning exercise
Responsiveness	Constitution of grand challenges and thematic research programmes Regulation Standards Open access and other mechanisms of transparency Niche management[a] Value-sensitive design Moratoriums Stage-gates[b] Alternative intellectual property regimes	Strategic policies and technology 'roadmaps' Science-policy culture Institutional structure Prevailing policy discourses Institutional cultures Institutional leadership Openness and transparency Intellectual property regimes Technological standards

Methods for practising ethics in R&I

Source: Reijers et al (2017)

Method types (number of sources using a method):		
Ex ante (8 methods; 16 sources)	Intra (14 methods; 31 sources)	Ex post (13 methods; 27 sources)
Identify emerging technologies	*Integrate ethicists in R&I contexts*	*Identify ethical impacts of existing technologies*
Ethical Issues of Emerging ICT Applications (ETICA) (2)	Ethical parallel research (1)	Ethical checklist approaches (5)
	Embedded researcher (1)	Swedish Council of Health Technology Assessment (SBU) approach (1)
	Walkshop approach (1)	Survival ethics (1)
Understand ethical impacts of emerging technologies	*Disclose ethical issues in technology design*	*Evaluate ethical impacts of existing technologies*
Scenario approaches (4)	Disclosive ethics (2)	Ethical Matrix (10)
		Network approach (2)
		Eclectic approach (1)
		Human practices (HP) approach (1)
Ethically evaluate emerging technologies	*Embed values in technology design*	*Organise the governance of ethical analyses*
Anticipatory Technology Ethics (2)	Value sensitive design (VSD) (9)	Socially responsible modelling framework (SRM) (1)
Ethical technology assessment (eTA) (1)	Human-driven design (2)	The Socratic approach (revisited) (1)
Impact and acceptability analysis (1)	Pro-ethical design (1)	Ethic-innovation model (1)
	Value analysis (1)	Just war theory (JWT) (1)
Ethics of uncertainty (1)	Triangular model (1)	
	Interactive technology assessment (iTA) (1)	
	Technological mediation approach (1)	
Assess claims concerning the impacts of emerging technologies	*Organise practising ethics in R&I*	*Support ethical decision-making with technology*
Discourse ethics (4)	Effective, Technical and Human Implementation of Computer based Systems ETHICS (6)	Metric of evil (1)
Pragmatist NEST-Ethics (1)		Ethical algorithm (1)
	Ethical Impact Assessment (EIA) (3)	
	Rapid Ethical Assessment (REA) (1)	

The number of sources using each method is indicated in brackets

Appendix B – Indicators and Rubric to Assess Responsible Innovation

Indicators for Responsible Innovation from EU Expert Group

The rubric developed by Wickson and Carew (2014) contains statements on each of these topics that make clear "what could be considered routine, good, great and exemplary examples of practice against each quality criterion" (p.10). They claim that it can among others be used "to evaluate and compare the quality of RRI in different projects and initiatives" – and if that is so, it could perhaps also be used to compare the quality of responsible innovation processes in different companies.

Socially relevant and Solution oriented	(a) Type of problem addressed (b) Type of solution sought
Sustainability centered and Future scanning	(a) Anticipating potential futures (b) Identifying potential risks and benefits (c) Considering social, economic and environmental sustainability
Diverse and Deliberative	(a) Level of cross-disciplinarity involved (b) Where stakeholders are involved (c) How stakeholders are involved
Reflexive and Responsive	(a) Recognition of preconditions in context and group (b) Exploration of underlying values, assumptions and choices (c) Openness to critical scrutiny (d) Ability to change after internal reflective practice and external feedback
Rigorous and Robust	(a) Aspects of the problem considered (b) Repeatability across actors and settings (c) Reliability of outcomes under real-world conditions
Creative and Elegant	(a) Novelty and daring (b) Sufficiency and beauty
Honest and Accountable	(a) Identification of uncertainties and limitations (b) Lines of delegation and ownership (c) Compliance with research ethics and governance requirements (d) Policies on open access and information sharing (e) Ownership over positive and negative outcomes

Table 6 – Topics and elements included in a rubric for assessing RRI[47]

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[47] Source: Wickson and Carew (2014)

Source: Spaapen et al. (2015)

Proposed indicators for governance

Criterion	Performance indicators		Perception indicators	Key actors
	Process indicators	**Outcome indicators**		
Governance	Identification of formal and informal networks of R & I that promote RRI, at both the national and the EU level	For each of these networks: • number of RRI debates • number of RRI protocols • number of RRI policies • number of RRI agreements	Involvement of the wider public in RRI debates, measured for example through social media Involvement of the wider public in RRI policy, the development of policy, protocols	National and supranational governments, major stakeholders in science and society
Governance	Activities of funders to promote RRI	Number of funding mechanisms to support RRI activities Number of euros invested in RRI projects	Number of references in applications to RRI Number of collaborative RRI projects	Funding organisations, stakeholders

Proposed indicators for public engagement

Criteria	Performance indicators		Perception indicators	Key actors
	Process indicators	**Outcome**		
Policies, regulation and frameworks	**Formal commitment**	**PE funding percentage from R & I** Public influence on research agendas Share of PE in R & I projects based on consultation, deliberation or collaboration	**Public expectations of involvement** Researchers' openness to pursue PE Interest of publics	
Event and initiative making **Attention creation**	**Science events and cycles** **Referenda** and Danish-model activities. Organised debates **Museums/science centres** Informal settings Citizen science initiatives Crowdfunded science and technology development	**Media coverage** Social media/web 2.0 attention **Museum visits** and **impacts** (on visitors, stakeholders, local communities) Civil society organisation activities and impacts	**Engagement activities (ladder)** **Interest in science** **Issue discrimination** **Image of an 'atmosphere' of scientific culture**	• States • Regions • Cities • Universities • University departments • Research centres • Research projects • Sections of the public • Civil society organisations
Competence building	**Training of communicators** Training of scientists/engineers Mediators Grass roots	PR staffing Social scientists collaboration In-house/outsourced consultancies **The state of science journalism**	**Knowledge, beliefs** **Trust, confidence** **Attitudes (utilitarian expectations, fundamental orientations)**	

Proposed indicators for gender equality

Criteria	Performance indicators		Perception indicators
	Process indicators	Outcome indicators	
Gender equality	Percentage of Member State funding programmes explicitly including gender requirements Percentage of research institutions (including universities) that (a) have gender equality plans and (b) provide documentation of their implementation Percentage of research institutions that document specific actions that minimise /reduce barriers in work environment that disadvantage one sex (e.g. flexibility of working hours) Percentage of research institutions that document specific actions aiming to change aspects of their organisational culture that reinforce gender bias Percentage of research institutions that provide training/support for researchers in regard to the inclusion of gender dimensions in the content of research Percentage of schools (primary and secondary) that have programmes promoting gender equality issues in regard to career choices	Percentage of women on advisory committees Percentage of women in expert groups Percentage of women on proposal evaluation panels Percentage of women in projects throughout the whole life cycle (in full-time equivalent) Percentage of women that are principal investigators on a project Percentage of women that are first authors on research papers Percentage of research projects including gender analysis/gender dimensions in the content of research Percentage of women taking part in research mobility programmes	Perception of gender roles in science amongst young people and their parents, e.g. percentage of young people who believe that science careers are equally suitable for both women and men; percentage of parents who believe their children (daughters) will have equal opportunities to pursue a career in STEM Perception of people working in the area of R & I in regard to gender equality, e.g. percentage of women in R & I, who believe they have equal opportunities to pursue their careers in R & I in comparison to men

Proposed indicators for science education

Criteria	Performance indicators	
	Process indicators	**Outcome indicators**
Science education	The inclusion of an initiative or requirement for RRI-related training in a research strategy/call/work programme, etc. (yes/no, percentage) Capacity building for RRI-related training (existence, percentage of funds allocated)	EU and national levels: presence of RRI descriptors in the qualification frameworks for lower and higher education Education institutions/research disciplines: presence of RRI education/training R & I project level: do they encourage or require RRI education/training (e.g. in an integrated ELSA model)? Percentage of research projects with at least one educational resource deliverable Percentage of research projects involving STEM teachers or students Number of projects registered in the Scientix collaboration

Proposed indicators for open access / open science

Criteria	Performance indicators		Perception indicators
	Process indicators	**Outcome indicators**	
Open access/open science	Documentation of open science policies Documentation of institutional mechanisms for promoting open science Documentation of mechanisms for learning from open science experience Inclusion of open science measures in research policies and calls for proposals	Percentage of research projects with a virtual environment that is updated and actively used with a threshold frequency (to be defined) Percentage of data repositories that include explanation and commentary to facilitate use Percentage of research projects with daily laboratory notebooks online Percentage of research projects that report real added value by an open science mechanism (for themselves and/or other actors)	The extent to which members of the public has visited such environments and found them useful

Proposed indicators for ethics

Criteria	Performance indicators	
	Process indicators	**Outcome indicators**
Ethics	Mechanisms for multi-stakeholder/transdisciplinary processes of appraisal of ethical acceptability (best practices) Documented ELSI/ELSA project component for ethical acceptability (best practices) Documentation regarding normative tensions related to research integrity policies and actions Formal and actual scope of ethics review/IRB clearance	Documented change in R & I priorities attributable to appraisal of ethical acceptability Percentage of research proposals for which ethics review/IRB clearance process requires substantive changes in grant application or second ethics assessment

Rubric for Assessing RRI

Source: Wickson and Carew (2014)

Criteria	Exemplary	Great	Good	Routine
Socially relevant and Solution oriented	Addressing a grand social challenge. Ongoing analysis of objectives and processes to favor the delivery of 'wicked solutions' (solving multiple challenges simultaneously)	Addressing a significant social need. Ongoing analysis of objectives and processes to maintain a focus on delivering a successful solution	Focused on a marginal or self-defined problem. Employing processes aimed at generating insights toward a solution, or a partial solution	Pursuing a purely personal interest. Possibility that process/product will only result in the creation of decontextualized knowledge or new problems
Sustainability centered and Future scanning	Inclusion of formal processes of future casting to at various points throughout the research and innovation process. Generating a range of positive and negative future scenarios and identifying and assessing associated risks and benefits of these for social, environmental and economic sustainability. Clear avenues for embedding responses to these possible futures and risk/benefit assessments into the project development	Inclusion of future casting activities at some point during the research and innovation process. Some attempt to integrate an assessment of the risks and benefits for social, environmental and economic sustainability. Identifiable points and possibilities for adaptation of the process to respond to the future scanning and risk/benefit assessment activities	Informal attempts to future cast at limited points in the project. A consideration of some associated risks and benefits in terms of one or more of the three dimensions of sustainability. Little indication of how the research and innovation process may adapt and respond to either identified possible futures or their risks to sustainability	A singular optimistic prognosis for future project outcomes with no clear effort to identify risks or survey possible future scenarios
Diverse and Deliberative	Openly and actively seeking ongoing critical input, feedback and feed-forward from a range of stakeholders. Encouraging and rewarding transformative mutual learning. Employing an evolving integrative method and consciously employing a TD process	Inviting, incorporating and integrating stakeholder views at various points along the research and innovation process. Actively seeking dialogic interaction with stakeholders and open to mutual learning. Encompassing a wide range of methods and adopting an interdisciplinary process	Limited stages of the research and innovation process open for stakeholder engagement. Tendency toward one-way forms of communication with stakeholders but open to some interaction. Involving some level of methodological diversity and multidisciplinary practice	Communicating with stakeholders only toward the end of the research and innovation process. Use of one-way communication approaches and defensive in the face of counter-views or stakeholder questions. Mono-methodological and mono-disciplinary

Criteria	Exemplary	Great	Good	Routine
Reflexive and Responsive	Clear and explicit identification of institutional and contextual limitations and a structured effort to acknowledge and improve upon these conditions. Structured, purposeful periodic analytical review of underlying values, assumptions and choices. Actively seeking critical feedback from a wide group of sources and actors. Evidence of potential to adapt at a range of points in response to in-train reflective practice and external review/input/feedback	Explicit effort to identify institutional and contextual limitations and awareness of their significance for practice. Occasional use of structured process for reflecting on underlying values, assumptions and choices. Actively seeking critical feedback from select sources and actors. Clear indications of a capacity to adapt in response to reflective practice and external feedback	Some indication of awareness concerning limitations posed by institutional structure and contextual realities. Informal, one-off or ad hoc process for considering underlying values, assumptions and choices. Accepting critical feedback when offered. Stated willingness to accept change in response to internal reflective practice or external review and critique	No explicit consideration or recognition of the limitations posed by institutional structure and contextual realities. No process for facilitating reflective practice. No critique sought. No evidence for potential for change in response to criticism/ unsolicited feedback
Rigorous and Robust	Comprehensive investigation of all aspects of the problem and the interconnections between them. Results repeatable by a variety of different actors operating across a range of relevant conditions. Outcomes work reliably under real-world conditions	Considering multiple dimensions of the problem and their interrelations. Results repeatable by the same actors operating under a range of relevant conditions. Outcomes with demonstrated functionality under real-world conditions	Interest in several dimensions of the problem although not necessarily their interrelations. Results repeatable by the same actors operating under similar conditions. Outcomes remain untested under real-world conditions	Narrow focus on one element or aspect of a problem. Results not able to be replicated. Outcomes unable to be reliably applied in real-world contexts
Creative and Elegant	The problem has been reframed in innovative directions, with new ideas being pursued through appropriate methods. Resources are carefully considered and allocated to efficiently achieve maximum utility and impact. Esthetical consideration is given to preconditions, process and products	New methods are being developed according to new ideas within an established problem framing. The use of resources is explicitly justified. Esthetical consideration is given to preconditions and products	New ideas are being pursued through established methods within an accepted problem framing. Considerable resources are inefficiently employed. Esthetical consideration is given to envisaged products	Problem framing, ideas and methods fall within established paradigms. Extensive resources (e.g. time, money, personnel, etc.) are dedicated to work with minimal significance or potential impact. No consideration is given to the esthetics of operating preconditions, research and innovation process or envisaged products

Honest and Accountable	Transparent identification of a range of uncertainties and limitations that may be relevant for various stakeholders. Openly communicated lines of delegation and ownership able to respond to process dynamics and contextual change. Documented compliance with highest-level governance requirements, research ethics and voluntary codes of conduct, all actively monitored throughout. Consistent use of open access to information policies. Preparedness to accept accountability for both potential positive and negative impacts	Identification of uncertainties and limitations deemed to be significant by those involved. Established lines of delegation and ownership. Compliance with governance requirements and research ethics with evidence of active monitoring throughout. Favoring open access to information policies. Willingness to accept accountability for potential positive and negative impacts	Some statement indicating uncertainties and limitations. Indications of potential lines of delegation and ownership. Complying with minimum standards of governance requirements and research ethics. Occasionally employing open access to information policies Willingness to accept accountability for positive impacts and some negative impacts	No transparency concerning limitations and uncertainties. Untraceable ownership of components. No specific acknowledgement of standards concerning governance requirements or research ethics. No demonstrated commitment to open access information policies. Accountability only accepted for positive outcomes

Appendix C – (Academic) Initiatives Relevant for Addressing 'MindPrint Concerns'

Academic initiatives

Name	University	Location	Weblink	Major Goal
4TU.Centre for Ethics and Technology	Universities in Delft, Eindhoven, Twente and Wageningen	The Netherlands	http://ethicsandtechnology.eu/	Stimulating interdisciplinary research into the ethics of technology
Briq Institute on Behavior & Inequality	University of Bonn	Bonn, Germany	https://www.briq-institute.org/about	The institute promotes innovative thinking and research in the fields of behavioral economics and the sources of inequality.
Carnegie Mellon Center for Human Compatible AI	Carnegie Mellon; UC Berkeley	Berkeley, US	http://humancompatible.ai	CHAI's goal is to develop the conceptual and technical wherewithal to reorient the general thrust of AI research towards provably beneficial systems
Center for Digital Ethics and Policy	Loyola University Chicago	Chicago, IL	http://www.digitalethics.org/	Fostering more dialogue, research, and guidelines regarding ethical behavior in online and digital environments
Center for Internet and Human Rights	European University Viadrina	Frankfurt, Germany	https://cihr.eu/ethics-of-algorithms/	Inform discourse on internet debates using empirical data
Center for Healthy Minds	University of Wisconsin-Madison	Madison, US	https://centerhealthyminds.org/about/overview	What if our world were a kinder, wiser, more compassionate place? A place where we exercise our minds just like we exercise our bodies?
Center for Practical Wisdom	University of Chicago	Chicago, US	http://wisdomresearch.org/Arete/About.aspx	The mission of the Center is to deepen our scientific understanding of wisdom and its role in the decisions and choices that affect everyday life
Committee on Global Thought	Columbia University	New York, US	http://cgt.columbia.edu	To understand the changing conditions of our contemporary world, we require new concepts and categories that pertain to and are derived from global phenomena as they are rapidly evolving.
DeepMind Ethics and Society	None (DeepMind is part of Alphabet/Google)	London	https://deepmind.com/applied/deepmind-ethics-society/	Building artificial intelligence that works for the benefit of all. DeepMind is the world leader in artificial intelligence research and its application for positive impact.
Delft Design for Values Institute	Delft University of Technology	Netherlands	http://designforvalues.tudelft.nl	
Digital Planet	Tufts University	Boston, MA	https://sites.tufts.edu/digitalplanet/	Understanding the impact of digital innovation on the world to help form policy

Electronic Frontier Foundation	None	San Francisco, CA	https://www.eff.org	Defending civil liberties (free speech, privacy) online
Future of Humanity Institute	University of Oxford	Oxford, UK	https://www.fhi.ox.ac.uk/	Understanding the challenges of the future, especially with regard to AI and biotech
Future of Life Institute	None	Boston, MA	https://futureoflife.org/open-letter-autonomous-weapons/	Examining both the risks and benefits of technology, especially AI
Global Forum on Cyber Expertise	None	The Hague, Netherlands	https://www.thegfce.com/	Building international cyber capacity
ICPSR	University of Michigan	International	https://www.icpsr.umich.edu/	Maintaining a data archive of more than 250,000 files of research in the social and behavioral sciences
IEEE	None	New York City	http://www.ieee.org/about/vision_mission.html?utm_source=mm_link&utm_campaign=mav&utm_medium=ab&utm_term=mission%20vision	Professional Organization advancing technology for the benefit of humanity
Image Knowledge Gestaltung	Hermann von Helmholtz University	Berlin	https://www.interdisciplinary-laboratory.hu-berlin.de/en/bwg/ueber-uns/	Bringing together various disciplines to collaborate in architecture and design
Immigration Stories at the Immigration History Research Center	University of Minnesota	Minneapolis	https://cla.umn.edu/ihrc/immigrant-stories/about-project	Digital Storytelling, Documenting the lives of people today for historical record utilizing technology
Interdisciplinary Center for Bioethics	Yale University	Conneticut, US	https://bioethics.yale.edu	Encouraging informed discussion of the issues raised by our increasing powers over life, especially regarding justice and rights, familial responsibility, corporate and state power
John J. Reilly Center for Science, Technology, and Values	University of Notre Dame	South Bend, IN	https://reilly.nd.edu	Inspiring student reflection on connections between and across disciplines, exploring the historical, philosophical, and ethical dimensions of science and technology
Leverhulme Centre for the Future of Intelligence	University of Cambridge	Cambridge, UK	http://lcfi.ac.uk/about/	Exploring the opportunities and challenges of potentially epoch-making technology, especially AI
Markkula Center for Applied Ethics	Santa Clara Univeristy	Santa Clara, CA	https://www.scu.edu/ethics/about-the-center/center-news/	Studing ethics, with programs including Internet Ethics and Journalism Ethics
Media Ecology Association	None	New York City	http://www.media-ecology.org/index.html	Promoting academic research and discussion in the study of how media shapes life

Media Policy Project	London School of Economics	London	http://blogs.lse.ac.uk/mediapolicyproject/about/	Working with EU policy makers to inform policies around media technologies
MIT Initiative on Technology and Self	MIT	Boston, MA	http://www.mit.edu/~sturkle/welcome.html	Examining the subjective side of people's relationships with technology
New York Institute for the Humanities	New York University	New York City	http://www.nyihumanities.org	Being a forum for exchange of ideas between the humanities
Olsson Center for Applied Ethics	University of Virginia	Virginia, US	https://www.darden.virginia.edu/olsson/about/	Promoting the role of ethics in business
ONLIFE Initiative	None	EU	https://ec.europa.eu/digital-single-market/en/news/onlife-initiative-concept-reengineering-rethinking-societal-concerns-digital-transition	Studying the impact of Information and Communications Technologies (ICTs) upon the human condition
Open AI	None	San Francisco, CA	https://openai.com/	Advancing AI as a benefit to humanity
Open MIND Project	Johann Wolfgang Goethe-Universität	Frankfurt, Germany	http://open-mind.net/	Exploring the philosophy of the mind and cognition
Oxford Digital Ethics Lab	University of Oxford	Oxford, UK	http://digitalethicslab.oii.ox.ac.uk	Enhancing the positive opportunities of digital innovation as a force for good, and avoiding or mitigating its risks and shortcomings
Penn World Well-Being Project	University of Pennsylvania; Positive Psychology Center	Pennsylvania, US	http://www.wwbp.org/about.html	The World Well-Being Project (WWBP) is pioneering scientific techniques for measuring psychological well-being and physical health based on the analysis of language in social media
Pew Research	None	Washington D.C.	http://www.pewresearch.org/	Linked article reports data on the changing ways people are engaging with news and technology
Princeton University Center for Human Value	Princeton University	Princeton, NJ	https://uchv.princeton.edu/	Examination of the questions of value, moral identities, and ethics
Public Reason: A Blog for Political Philosophers	None	International	http://publicreason.net/	Providing a forum for public philosophy reserachers to share work
Responsible Robotics	None	The Hague, Netherlands	https://responsiblerobotics.org	Educate and engage the public and policy-makers in the ethics of robotics
SciCom - Making Sense of Science	None	Brussels, Belgium	http://www.sci-com.eu/main/index.php	Championing evidence based policies on the risks and benefits of tech
Social Hotspots Database	None	Maine, US	http://www.socialhotspot.org	Providing supply-chain management tech to prevent human rights violations

Stanford Persuasive Technology Lab	Stanford University	California, US	http://captology.stanford.edu	The Stanford Persuasive Tech Lab performs research into computers as persuasive technologies and its ethical use.
Tech and Law Center	University of Milan	Milan, Italy	http://techandlaw.net	Promoting knowledge on the interactions of tech and law and society
The Economics of Ecosystems and Biodiversity (TEEB)	None	Geneva, Switzerland	http://www.teebweb.org	"Making nature's values visible" by demonstrating value of biodiversity
The Institute for Ethics and Emerging Technologies	None	Boston, MA	https://ieet.org/	stimulating and supporting constructive study of ethical issues connected with these powerful emerging technologies
The Virtual Institute for Responsible Innovation	Arizonia State University	International	https://cns.asu.edu/viri	contribute to the governance of emerging technologies under conditions dominated by high uncertainty, high stakes, and challenging questions of novelty
UC Berkley Center for Human-Compatible AI	University of Berkley (with others)	Berkley, CA	http://humancompatible.ai	Orienting the research around AI for beneficial purposes

Non-academic initiatives

Name	University	Location	Weblink	Major Goal
Center for Humane Technology	None	USA	http://humanetech.com	Reversing the digital attention crisis and realigning tech with humanities best interests
Data & Society	None	New York City	https://datasociety.net/	Focusing on the social and cultural issues arising from data-centric and automated technologies
Adolescent Brain Cognitive Development (ABCD) Study[48]	None	San Diego, US	https://abcdstudy.org	Determine how childhood experiences (including videogames and social media) interact with each other and with a child's changing biology to affect brain development and social, behavioral, academic, health, and other outcomes
American Institute of Physics	None	Washington, US	https://www.aip.org/aip/about-aip	Shaping the New Human Technology Frontier. The second big idea is called shaping the new human technology frontier
Vector Institute	Canadian	Toronto, Canada	https://vectorinstitute.ai	The Vector Institute will drive excellence and leadership in Canada's knowledge, creation, and use of artificial intelligence (AI) to foster economic growth and improve the lives of Canadians.

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[48] National Institutes of Health (NIH) funded

Appendix D – Important Corporate Accountability Frameworks and Standards

Financial Reporting

The Financial Accounting Standards Board (FASB[49])

In the United States the Financial Accounting Standards Board (FASB) is currently responsible for maintaining the conceptual framework for financial reporting and updating accounting standards when required. Corporations, securities regulators, professional organizations of accountants, financial analysts, institutional investors and board members of the standards setting committees have been engaged in commenting on the framework for financial reporting (Benson et al., 2007).

The information quoted below is derived mainly from the websites of these official standard setting bodies, as listed in the footnotes.

The International Accounting Standards Board (IASB)[50]

The International Accounting Standards Committee, formed in 1973, initially with a European focus, was the first international standards-setting body. It was reorganized in 2001 and became an independent international standard setter, the International Accounting Standards Board (IASB). Since then, the use of international standards has progressed. As of 2013, the European Union and more than 100 other countries either require or permit the use of International Financial Reporting Standards (IFRSs) issued by the IASB or a local variant of them. Both academics and practitioners have been active in ad-hoc committees providing feedback to the IASB on current issues and future research opportunities directed towards improving the IFRS Conceptual Framework (Gebhardt, Mora, & Wagenhofer, 2014).

ESG Reporting

The Global Reporting Initiative (GRI)[51]

GRI™ is an independent international organization that has pioneered corporate sustainability reporting since 1997. GRI's mission is to empower decision-makers everywhere, through its standards and multi-stakeholder network, to take action towards a more sustainable economy and world. The GRI Sustainability Reporting Standards (GRI Standards) are the latest evolution of GRI's sustainability reporting framework and were published in October 2016. The GRI Standards are structured as a set of modular reporting

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[49]http://www.fasb.org/home
[50] http://www.ifrs.org/about-us/
[51] https://www.globalreporting.org/Pages/default.aspx

standards that can be used by any organization to report about its impacts on the economy, the environment, and society. The GRI Standards are developed through a transparent, multi-stakeholder process and are issued by the Global Sustainability Standards Board (GSSB), an independent standard-setting body created by GRI. More information on the GRI Standards and the GSSB can be found on GRI's website. Thousands of organizations in more than 90 countries currently use the GRI Standards to report sustainability information. The GRI Standards are also referenced in policy or regulation in more than 40 countries and regions, and by almost 30 stock exchanges worldwide. GRI has garnered widespread legitimacy, as demonstrated not just by corporate compliance but also by the attainment of official recognition by governmental agencies and multilateral organizations such as the UN Global Compact (Levy et al., 2010).

The Global Initiative for Sustainability Ratings (GISR)[52]

The Global Initiative for Sustainability Ratings (GISR) mission is to drive transparency and excellence in environmental, social, and governance (ESG) research, ratings and indices to improve business performance and investment decision-making. Sustainability-oriented assets under management have eclipsed $20 trillion worldwide. These investments are shaped by sustainability research and ratings offered by more than 100 organizations covering more than 60,000 companies. Given the rapid growth in sustainable investing, the sustainability ratings market is reaching an inflection point.

As an impartial, multi-stakeholder initiative, GISR will advance excellence in ESG ratings, rankings and indices for measuring corporate sustainability performance. By advancing standards of excellence for financial market ratings, GISR aims to accelerate the integration of environmental, social and governance factors in corporate and investment decision-making. Elevating usage of ESG factors in company and investment decision-making will contribute to long-term positive change on social and environmental issues.

The Integrated Reporting Initiative (IR)[53]

Integrated reporting is a broad-based framework for business and investment decisions that are long term, inclusive and with purpose. The IIRC is a worldwide coalition with the mission to mainstream integrated thinking and reporting and to change the corporate reporting system so that this becomes the global norm. IR applies principles and concepts that are focused on bringing greater cohesion and efficiency to the reporting process and adopting 'integrated thinking' as a way of breaking down internal silos and reducing duplication. It improves the quality of information available to providers of financial capital to enable a more efficient and productive allocation of capital. Its focus on value creation, and the 'capitals' used by the

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[52] http://ratesustainability.org/about/
[53] https://integratedreporting.org

business to create value over time, contributes towards a more financially stable global economy. The Framework was released following extensive consultation and testing by businesses and investors in all regions of the world, including the 140 businesses and investors from 26 countries that participated in the IIRC Pilot Programme. The purpose of the Framework is to establish Guiding Principles and Content Elements that govern the overall content of an integrated report, and to explain the fundamental concepts that underpin them. The Consultation Draft (CD) notes that the fundamental concepts of <IR> underpin and reinforce the principles-based requirements to set out in the guiding principles and content elements. These fundamental concepts centre on the various capitals that a company uses and affects, the company's business model, and the creation of value over time (IIRC, 2013b, 6). The demand for Integrated Reporting comes from a broad set of stakeholders, ranging from customers and suppliers to investors and employees (Burke & Clark, 2016).

The AccountAbility Principles (AA1000)[54]
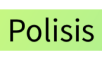
The AA1000 AccountAbility Principles Standard (2008) - currently in revision for launch by mid-2018 - outlines the foundational AccountAbility Principles. It is a globally accepted, principles-based framework applied by organizations of all sizes, to identify, prioritise, measure and respond to sustainability challenges inclusively and accountably.

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[54] http://www.accountability.org/standards/

Appendix E – Examples of Positive Technology Companies

These companies are illustrative for using product development methods that are based on concepts found in research on Positive Technology and Positive Design[55]:

Positive Technologies and Affective Computing

	Robotics	IoT	Biometrics	Persuasive Tech	Digital Platforms	Augmented Reality	AI and Big Data
Privacy	?	LIGHTHOUSE	BIOID® be recognized	ConsentCheq	OT	?	Polisis
Autonomy	TOYOTA	hiVE	:) Affectiva	TALA	lyft	VERE	BEYONDVERBAL
Security	SONY	PointGrab	empatica	skin analytics	PT	BEAMING Being in Augmented	eyeris
Control	Keymoment	drive.ai	crowdemotion	SoFi	lantern	IMMERSIVE REHAB	FREE LETICS
Power	mOm	BB	KEYO	Digital Green	CHATTERBOX	G	REINVESTMENT FUND
Human Dignity		gestigon	feel	koko	SUPERBETTER	INTERSTRESS	Humanyze
Justice	open bionics	Telensa	CONGENICA GENOME BASED MEDICINE	HEALER	BSR	RYOT	Receptiviti

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79