

Sustainability and technology: the contribution of “managerial talk” to the three pillars framework

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Abstract

Purpose – This article investigates whether accounting, a tool that affects the actions of both organisations and society, can contribute to further developing the concept of sustainability. Exploiting real-time accounts of management speeches, termed “managerial talk” in the context of this paper, the study is among the first to include technology within a sustainability framework.

Design/methodology/approach – A data structure with first-order and second-order categories was created using a methodology elaborated by Van Maanen (1979) and Gioia *et al.* (2012). The empirical data was collected during 20 presentations delivered by senior managers from companies, the financial industry, the Swedish government and non-profit organisations to the Swedish Society of Financial Analysts between November 2016 and February 2020.

Findings – The study develops an inductive model that emerges as a result of the data analysis process. It emphasises that technology can be both an enabler for, and an interference with, sustainability according to the application of steering mechanisms. The latter include governance and regulations, analysis and evaluation tools, and disclosure practice.

Research limitations/implications – Acknowledging the role of technology in sustainable development can potentially assist in the implementation of sustainability and, arguably, in fostering an alignment between the three pillars of sustainability.

Originality/value – Interrelationships between sustainability, technology and accounting comprise a relatively unexplored research setting that has seldom been at the centre of academic studies.

Keywords Sustainability, Technology, Accounting, “Managerial talk”

Paper type Research paper

1. Introduction

The concept of sustainable development was first formulated in 1987 when the World Conference on Environment and Development (WCED) defined sustainability as development that meets the needs of the present generation without compromising the

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ability of future generations to meet their own needs (WCED, 1987). The International Union for Conservation of Nature (IUCN) proposed three main pillars of sustainable development: social, environmental and economic (IUCN, 1980), also known as a “triple bottom line” (or three pillars) framework.

Even though sustainability has attracted increasing attention from researchers and regulators over the last four decades, the concept has not yet been defined unambiguously (Gond *et al.*, 2012; Lueg and Radlach, 2016). Gray (2010) observed that, despite everyone agreeing on the importance of sustainable development, its very nature and meaning are rarely discussed and analysed explicitly. It is common for organisations to refer to the concept of sustainable development in their annual reports, yet the statements which provide a clear definition of sustainability are largely absent (Tregidga *et al.*, 2014). Consequently, as Giovannoni and Fabietti (2013) concluded that “the vagueness and ubiquity of its definition” limit the actual implementation of sustainability (p. 22).

Notwithstanding the emphasis by several scholars on the ambiguity that remains within the definition of sustainability (Gray, 2010; Gond *et al.*, 2012; Comynsa *et al.*, 2013; Lueg and Radlach, 2016), the last decade has seen very few attempts at conceptual expansion to account for additional factors in the sustainability framework, a theoretical concept that first arose during the 1980s. Moreover, although the successful resolution of this complex problem regarding ambiguity in the definition and implementation of sustainability might require several theoretical perspectives and approaches, this cross-disciplinary research work seems to be only in the early stages of development (Burritt and Schaltegger, 2014; Adams and Larrinaga, 2019).

Another problem identified by numerous researchers within the sustainability field is that the current link between conceptual literature and practice remains relatively weak (Schaltegger *et al.*, 2015). Baldvinsdottir *et al.* (2010) concluded, firstly, that the sustainability research agenda derives mainly from existing studies without touching any grounds of organisational relevance and, secondly, that the wider research community has demonstrated scant interest in influencing managerial practice.

Albeit the state and direction of accounting discipline have been studied in a variety of ways and settings, there is a view that accounting research has become insufficiently innovative and increasingly detached from the practice of the craft (Hopwood, 1983; Le Breton and Aggeri, 2020). Addressing the challenge, this article investigates whether accounting, a tool that affects the actions of both organisations and society (Zimmermann and Werner, 2013; Le Breton and Aggeri, 2020), can contribute to the further development of the concept of sustainability (Schaltegger and Burritt, 2010, 2018; Georg and Justesen, 2017). Capitalising on the broader notion of sustainability being “an umbrella term” (Scherer and Palazzo, 2011, p. 922), the study explores the sustainability concept by searching for additional themes and dimensions outside the well-developed “triple bottom line” definition.

The main contribution of this paper is the proposal that technology should be included in the sustainability framework. Although debate on sustainable development has always had a technological component, the literature commonly focuses on the role of technology as a provider of increased efficiency and higher economic productivity (Feenberg, 2001; Paredis, 2011). In contrast, a question about the nature of technology, how technology influences and is affected by society, and what this relationship implies for sustainable development is rarely touched by academic scholars (Ludwig, 1997; Hansson, 2010; Polak, 2017).

The importance of technology across all areas of society grew substantially during the twentieth century; technological paths and innovation programmes began to influence economic competition between countries and regions, change the direction of flows of raw materials and affect value creation systems (Grunwald, 2017). Initially defined as the set of practices human beings use to transform the material world and create products they need,

technology can be further seen as a creative expression of human culture imbued with societal values (Schatzberg, 2018; Agar, 2019).

To benefit from technological progress and, at the same time, to minimise the undesirable effects of technical application, the idea of technology assessment from a societal perspective was introduced – but insufficiently developed – during the 1960s (Ludwig, 1997). A sociological approach to technology claims that a better understanding of the relationship between technology and society “is the key to building a better world” (Johnson and Wetmore, 2009, p. 441). Societal challenges related to technology and their importance for sustainable development however have been largely bypassed in the academic debate regarding the sustainability concept (Paredis, 2011; Grunwald, 2017).

Capitalising on the empirical data presented in this paper, the article proposes that technology is related to all three pillars of sustainability, acting both as an enabler for, and an interference with, the development of sustainability, and following the usage of steering mechanisms including governance and regulations, analysis and evaluation tools, and disclosure practice. This incorporation of technology into the “triple bottom line” framework is suggested to potentially assist in the implementation of sustainability and, arguably, in fostering the alignment between the three pillars of sustainability.

A second contribution of this study is an exploration of the accounting discipline as a method theory (according to categorisations suggested by Lukka, 2005) that can promote developments in other academic fields. In this paper, accounting (in its broad definition) has been applied as a theoretical lens in order to gain specific insights into the concept of sustainability. The article argues for instrumental usage of accounting as a method theory, providing a significant addition to the domain field of sustainability.

While the emergence of a comprehensive theoretical framework underlying sustainability currently remains elusive (Aerts *et al.*, 2006), exploiting the different perspectives and roles of accounting to broaden insights into the sustainability framework as well as testing new discourses to ensure better representations of sustainability might be the only way to move forward (Baker and Schaltegger, 2015). Following Fairclough (2010), the new discourses are considered to assist in constructing social reality through various performances, linguistic styles and rhetorical devices that have been used in particular accounts (see also Swales, 1990, 2011).

The article namely assumes that the ambiguity associated with the current definition of sustainability in the academic literature might push managers into searching for, and developing, sustainability targets, themes and processes drawn from experiences within their organisational settings (Lueg and Radlach, 2016). The study also argues that organisations management presentations (managerial speeches or “managerial talk”) may contain signals that incorporate discretionary (i.e. relevant and private) information about the concept of sustainability and its implementation in various businesses. As a result, analysis of managerial speeches (“managerial talk”) may not only contribute to the knowledge regarding the implementation of the three pillars of sustainability but also assist in the search for new themes and dimensions outside the current box (Lukka, 2010) of sustainability framework. Previously, the importance of signalling strategies for the incremental disclosure of information was suggested as primarily involving discourse via annual reports (Dainelli, 2013; Tregidga *et al.*, 2014; Adams and Larrinaga, 2019).

Several context-specific circumstances influence the selection of the empirical data for this investigation. Sweden, a part of the Nordic region and where the research project is located, seems to be a suitable choice for examining the relationship between sustainability, technology and accounting owing to this country’s: (1) leading global position in terms of sustainability (Robeco, 2021); (2) high level of industrial development, accompanied by the rapid adoption of advanced technologies (Digital Economy and Society Index (DESI), 2022)

and (3) advanced financial reporting quality and top national rates of sustainability reporting compared with those of many other countries (KPMG, 2020).

The empirical data for this article was collected during 20 presentations to the Swedish Society of Financial Analysts (SSFA) between November 2016 and February 2020. SSFA members were among the first in the country to engage in sustainable development discussions; they are seen to be and promote themselves collectively as a particular discourse community which is knowledgeable in sustainable development and business (SSFA, 2018). (see §3.1 for details.)

This study employs the methodology of qualitative data analysis developed, among others, by Van Maanen (1979) and Gioia *et al.* (2012); it encourages open coding and an informant-centric review of the collected data. This methodology promotes the tandem reporting of informant (first-order) concepts and researcher (second-order) voices. Gioia *et al.* (2012) and Gehman *et al.* (2018) argue that such an approach leads to more qualitatively rigorous results. A vibrant inductive model emerges from the data analysis process; it suggests strongly that technology may be an enabler of, and an interference with, sustainability. In turn, this dichotomy depends upon the application of steering mechanisms such as governance and regulations, analysis and evaluation tools, and disclosure practices.

Finally, through the consideration of real-time accounts of management speeches (“managerial talk”), this article responds to calls for further research into the possible means of linking conceptual literature with practice in respect of sustainable development and its reporting (Gray, 2010; Giovannoni and Fabietti, 2013; Schaltegger *et al.*, 2015; Burritt *et al.*, 2018; Laguir *et al.*, 2019). Operatively, the study can help regulators and managers to gather diverse information sources containing relevant and private disclosures, particularly presentations by managers of organisations or associations with leading roles in the sustainability debate.

The rest of the paper is structured as follows. *Section 2* outlines the analytical framework for this study and includes the following parts: (§2.1) the “triple bottom line” framework and the potential of technology to mitigate a few contradictions related to the sustainability theme; (§2.2) accounting discipline as an appropriate method theory for studying the concept of sustainability and (§2.3) managerial speeches (“managerial talk”) as a specific genre representing sustainability discourse (see Swales, 1990, 2011) and its relevance to exploring sustainability. *Section 3* discusses the research design and applied methodology. While *Section 4* summarises the empirical data structure, *Section 5* presents the analysis and findings. *Section 6* provides critical reflection and introduces the inductive model. *Section 7* concludes the article.

2. Analytical framework: sustainability and technology concepts and their disclosure through “managerial talk”

2.1 *Three pillars of sustainability and technology*

The requirement for an integrated approach towards sustainability and the need to balance the environmental, social and economic elements equally has been advocated by academics and practitioners but the potential challenges associated with implementing this integration have received less attention (Giovannoni and Fabietti, 2013; Burritt *et al.*, 2018; Golubeva, 2018; Mahmood *et al.*, 2018; Schaltegger and Burritt, 2018).

Additionally, Gray (2010) has argued that “sustainability is not only a complex and elusive notion but one which is fraught with potential contradictions” (p. 53). These potential contradictions stem from tensions between the different dimensions of sustainability that may occur when attempting to implement all the dimensions simultaneously as required by an integrated approach. Organisations and companies in this situation may perform well from the social and environmental perspectives but struggle to secure sufficient financial

resources for their development (Gond *et al.*, 2012). Alternatively, financial performance may imply utilising technologies that increase the consumption of resources and, therefore, are detrimental to the environmental pillar (Giovannoni and Fabietti, 2013). Arguably, the main challenges identified within the current literature concerning sustainability are the divergent contradictions existing between the three pillars and the difficulties associated with implementing these three pillars of sustainability (Burritt *et al.*, 2018; Laguir *et al.*, 2019).

Interestingly, since the “triple bottom line” framework was introduced in the 1980s, contemporary literature has seen very few attempts at expanding the concept of sustainability beyond the three pillars scheme. Beckmann *et al.* (2014) were among the exceptions to argue that trade-offs between social, environmental and economic sustainability aspects at the operational level can be transformed into strategic advantages through technological innovations. Several researchers further suggest that management control systems (MCS) are essential for fostering the integration and implementation of the social, environmental and economic dimensions of sustainability (Gond *et al.*, 2012; Lueg and Radlach, 2016; Laguir *et al.*, 2019; Jawaid and Faruq, 2021). Such theoretical arguments and empirical evidence encourage further searching for concepts/factors that might potentially assist in the implementation of sustainability and in fostering an alignment between the three pillars of sustainability.

Addressing the current research gap, this article found that technology should be integrated into the sustainability framework, a conclusion that provides a new awareness of the interdependency between the three pillars of sustainability and technology.

Etymologically, *technology* has its roots in the Greek “*techne*”, a term that initially referred to skills of working with wood but which later expanded to cover specialist expertise and know-how (Schatzberg, 2018). The *instrumentalist* interpretation, assuming neutrality of technology in society, remains the most widely accepted definition in the sustainable development debate: “A hammer is a hammer, a steam turbine is a steam turbine, and such tools are useful in any social context” (Feenberg, 2001, p. 6). The alternative view often builds on the *substantive* interpretation of technology: technology is an autonomous, almost uncontrollable and mainly negative power that fundamentally reshapes human culture and values, without any social institution being able to stop this evolution or redirect it (Feenberg, 2001).

A more balanced approach, grounded on recent traditions in the *sociology of technology*, claims that society and technology are shaping and being shaped by one another (Johnson and Wetmore, 2009). Despite this sociological approach to technology having evidenced its importance in the sustainability debate, substantial efforts are required to strengthen its theoretical and empirical foundations (Paredis, 2011).

In this study, following a sociological approach to technology, the term “technology” is applied in a broad sense, encompassing not only rationality tools and knowledge expertise but also cultural and social components that reflect the diversity of particular organisational settings (Schatzberg, 2018; Agar, 2019). Understanding that technology and society are co-evolving leads to various implications such as how power relations and redistribution of resources are changed through technologies, how financial values and accounting techniques influence technologies and how technologies can shape the daily management of organisations.

Why might technology be important for the sustainability framework? It has been suggested that all available resources, including a broad range of capital, should be directed towards achieving sustainability goals (Giovannoni and Fabietti, 2013). While natural, social and financial capital have already been incorporated into the three pillars structure and its respective research agenda, resources associated with technology are often missing from these analyses. How can the conceptualisation of sustainability, as well as the decision-making and actions related to its implementation, be possible without considering, for example, manufacturing and intellectual capital?

There are theories which advocate that improvements in efficiency through technological advances reduce the number of resources used per unit of production or consumption

and that technology can help to overcome sustainability challenges. As an example, Roberts *et al.* (2003) argue that to avoid continued global warming and to reduce carbon dioxide emissions, “it will be necessary to improve the quality and energetic efficiency of the infrastructure of production, distribution, and consumption” (p. 304). On the other hand, there is a considerable amount of evidence in various contexts that improved efficiency through the development of technology often correlates with the increasing use of resources (York and McGee, 2016).

About one and a half centuries ago, William Stanley Jevons (1865) observed that the greater efficiency of steam engines led to greater consumption of coal because the improved efficiency made steam engines more cost-effective and, therefore, more attractive to investors (Jevons, 1865)[1]. Framing the *Jevons paradox* in terms of complex system thinking highlights the limited usefulness of the concept of energy efficiency as an indicator of sustainability (Giampietro and Mayumi, 2018). Furthermore, Jevons associations are commonly described as multifaceted phenomena; therefore, sustainability cannot be achieved by technological innovations alone, but probably requires a continuous process of institutional and social adjustments (York and McGee, 2016; Giampietro and Mayumi, 2018).

Alongside the optimistic assumption that whatever is technically new will benefit society, a possible negative side effect of technical innovations has begun to be addressed by a few scholars (Ludwig, 1997). As pointed out by Grunwald (2017), failures in the implementation of technology might create severe difficulties for humanity, including accidents in nuclear facilities, air and water pollution, negative health effects from asbestos usage, and labour market problems caused by productivity gains and the intentional abuse of technology.

Moreover, there are substantial geographical differences in access to modern digitalisation technology between countries and between affluent and impoverished peoples, a phenomenon that is commonly referred to as the *digital divide* (Unerman and Bennett, 2004). Finally, Polak (2017) warns about threats to human rights and democracy because progress in technical means of communication offers almost unlimited opportunities for invisible control and intervention in the private life of individuals and organisations.

The paradoxical features of the Jevons association and/or the digital divide do not, however, constitute a claim that these contradictions cannot be explained; neither is it an assertion that improving efficiency and digitalisation are always necessarily bad for sustainability (Sorrell, 2009). On the contrary, they identify something that needs to be explained due to the importance of technological developments for the achievement of sustainability. Contradictions within the relationship between sustainability and technology may therefore encourage the search for governing mechanisms for driving technology as a facilitator of sustainable development. As an example, public policies can be designed to ensure that technological developments are converted into lower resource consumption and equal access to digitalisation tools (Gillingham *et al.*, 2013).

It seems like if modern technology is utilised properly, sustainability strategies which simultaneously seek environmental, social and economic benefits may probably be improved over time. If the three pillars of sustainability are all part of a broader and integrated notion of sustainability, their coexistence alongside technology might reduce those difficulties that need to be overcome during the actual implementation of sustainability (regarding implementation challenges, see Gray, 2010; Gond *et al.*, 2012; Lueg and Radlach, 2016). To sum up, an integrative implementation of the environmental, social and economic pillars might eventually be improved if they were to be viewed through the prism of a technological dimension.

2.2 Accounting as a method theory for studying the concept of sustainability

Lukka and Vinnari (2014, 2016) distinguished between domain theories and method theories in accounting research. A domain theory is commonly identified through the phenomena, core problems and topics that typify a particular discipline; one example may be the

management accounting field. Method theory, in turn, can be defined as a meta-level conceptual system, or theoretical lens, which can be derived from other fields such as sociology, social theory and organisational studies (Lukka, 2005; Lukka and Vinnari, 2014). Although Lowe *et al.* (2016) argue that, in practice, a distinction between domain and methods theories “may be virtually impossible” (p. 305), these two analytical categories seemed to offer a useful role for this study despite their definitions remaining imprecise to some extent.

The article’s theoretical ambition is to develop the sustainability concept beyond the three pillars framework, a theory that is assumed to have a domain role in the research setting. According to its narrow definition, accounting is about recording and controlling systems that define and monitor behaviour (Farjaudon and Morales, 2013). On the other hand, a broader definition of accounting emphasises the contingent nature of the accounting discipline, aiming to provide an understanding of how particular accounts emerge from organisational and social surroundings (Hopwood, 1983; Burchell *et al.*, 1985). Moreover, accounting rules do not merely reflect the task for which they are assigned; they are also designed concerning the institutional setting in which they are embedded (Zimmermann and Werner, 2013).

It is proposed that accounting (in its broad definition) should be applied as a method theory that potentially offers additional and/or a revised perspective for gaining new insights into the domain concept of sustainability. While the application of method theories or theoretical lenses is not a novel phenomenon in accounting articles, the research designs of such studies commonly employ various theoretical perspectives to enhance our understanding of the domain field of accounting and, specifically within this field, management accounting (Gurd, 2008; Lukka and Vinnari, 2014).

In contrast, the exploration of the accounting discipline as a method theory that can contribute to the development of other academic fields of interest is much less studied by accounting scholars. This is even though accounting has recently started to gain feasibility within the domain field of sustainability research. As an example, the environmental literature actively employs monetary accounting methods to evaluate eventual losses and gains in the distribution of resources and the assessments of the value of ecosystem services (Lu *et al.*, 2020; Liu *et al.*, 2020).

There is an obvious threat that some method theories may at least be partially incompatible with the domain theories, as noted by Lowe *et al.* (2016). There arises an important question that should be addressed before processing with investigations: why is the accounting discipline (in its broad definition) a suitable method theory for studying the field of sustainability?

Firstly, suggestions drawn from sustainability studies are overly conceptual and commonly infeasible in practice (Schaltegger and Burritt, 2010; Parker, 2011; Burritt *et al.*, 2018). Sustainability remains only a declaration of interest, even if represented by a wide range of accounting metrics unless organisations and companies make serious efforts to enforce it (Lueg and Radlach, 2016). To ensure sustainable development, the current fragile link between the conceptual literature and empirical settings should be strengthened rather quickly (Schaltegger *et al.*, 2015; Lueg and Radlach, 2016).

Accounting activities (such as assessments of the costs and benefits of actions, the reporting of performance, the setting of financial standards and financial planning and control) play a key role in the functioning of modern organisations (Hopwood, 1983). Based upon the empirical evidence reviewed over a decade, Amernic and Craig (2009) concluded that, commonly, accounting as an “unbiased, dispassionate, ethically sound, and a natural indicator” (p. 878) has been employed to describe the fundamental essence of organisations. In every type of account, the process of accounting refers to the mapping of company activities in accrual numbers, as pointed out by Zimmermann and Werner (2013). We argue that accounting, being intertwined with the functioning of enterprises and their

representations, can be also a suitable tool for gaining additional insights into sustainability phenomena within organisations, and possibly contributing towards developments within this domain field.

Secondly, an identity of “sustainable organisation” has been constructed often in relation to a social concept of hegemony because sustainability requirements represent a fundamental threat to the existence of traditional business models within a society (Tregidga *et al.*, 2014). In this context, an organisational discourse on sustainable development can be interpreted as an attempt to minimise this hegemonic threat; corporate financial and sustainability reports may be viewed as a response to this threat to keep a legitimate voice in the discursive sustainability debate (Unerman and Bennett, 2004).

Accounting gains its significance not only by the mapping and shaping of organisational actions but also due to its role in the emergence and retention of modern institutional forms and social patterns (Hopwood, 1983; Farjaudon and Morales, 2013; Walker, 2016). Implementation of the sustainability framework presumes that market economy rules will be enhanced by sustainability requirements, which in turn demands that the construction of new and/or revised organisational accounts should be carried out. The exploration of the sustainability concept might, therefore, benefit from the accounting discipline due to the ability of accounting to map, reproduce and enhance societal norms of behaviour in accounting terms.

Furthermore, an explicit distinction in the study between theories identified as domain theory (sustainability framework) and method theory (accounting discipline in its broad definition) will, hopefully, facilitate discussion among scholars and provide better interconnection between academic studies and the real world of practice, as suggested by Lukka and Vinnari (2016).

2.3 Which accounting discourses are relevant to exploring sustainability?

Elkington (1998) confronted the meaning of traditional financial accounting and argued for additional social and environmental considerations to be incorporated into financial reports. Sustainability accounting and reporting have developed with the primary purpose of addressing the strategic integration and interrelationships of all three perspectives of sustainability for corporates and organisations (Burritt and Schaltegger, 2014). Global Reporting Initiative (GRI), a global best practice and benchmark in sustainability reporting, has highlighted the various dimensions of sustainability (i.e. economic, social and environmental) that should be included and disclosed within reporting activities [2]. GRI has been quite successful so far in both providing a regulatory framework for managers and promoting research concerning non-financial reporting among scholars (Lueg and Radlach, 2016; Deegan, 2017; Burritt *et al.*, 2018). Despite the high profile accorded to sustainability accounting and reporting by different stakeholders, considerable pessimism remains concerning what has been achieved (Tregidga *et al.*, 2014; Baker and Schaltegger, 2015). A key problem that emerges from the literature is that a gap exists between sustainability reporting and organisations’ actual performance (Gray, 2010; Burritt and Schaltegger, 2010; Deloitte, 2016).

Accounting scholars have commonly applied *signalling/disclosure* theory when explaining how companies may attempt to signal news either through the use of mandatory annual reports (Lys *et al.*, 2015) or by voluntarily releasing incremental information to market players (Beyer *et al.*, 2010; Dainelli, 2013; Datt *et al.*, 2019).

The annual report has been a cornerstone of corporate reporting for more than a century and has been broadly and successfully applied as the data source for sustainability disclosures (Beyer *et al.*, 2010; Comynsa *et al.*, 2013; Lys *et al.*, 2015). On the other hand, representations of accounting (through sustainability and/or annual reports) require further debate; these discourses are repeatedly labelled as “fashion with little substance” (Burritt and Schaltegger, 2010), “window-dressing or green-washing” (Georg and Justesen, 2017), or as managing

impressions and ensuring corporate legitimacy (Aerts *et al.*, 2006). Campbell *et al.* (2009) observe that the corporate annual report has been transformed into a marketing and public relations document. To sum up, despite the popularity of signalling/disclosure theory in accounting studies, the expected association between organisations' sustainability disclosures through financial reporting remains ambiguous and unresolved (Datt *et al.*, 2019).

Addressing this concern, signalling/disclosure theory has, during the last decade, enlarged the range of potential signals, sources and contexts in which signalling occurs (Gaffikin, 2009; Datt *et al.*, 2019). In the world of Norman Fairclough (2010), social structures are seen as constituted by multiple social practices which are, among others, a configuration of different genres (such as news and editorials) and various discourses (such as representations by political parties). The new genres may therefore include texts, documentary materials, images, lectures, etc. (see also Swales, 1990, 2011).

Representation of the sustainability concept can probably be traced through numerous discourse channels if accounting is considered to be a strategic and legitimising device (Adams and Larrinaga, 2019). As an example, in order to be accountable, an organisation may signal their sustainable identity through representation by its top managers (Lester *et al.*, 2006). Representation, which is an important element in the process of organisational identification, often involves someone talking about or on behalf of the group (Tregidga *et al.*, 2014). Contributions by such counter accounts (Laine and Vinnari, 2017), signalling sustainability through various channels, can prove to be an important addition to financial reports, especially when representation is happening under a permanently changing external and internal organisational environment.

Additionally, a few accounting studies started to adopt the corporate *communication* perspective, suggesting that the CEO's discourse or CEO-speak is broadly used to create corporate credibility and organisational image (Amernic and Craig, 2006, 2017). A certain "breakthrough" in literature can be noticed with various communication tools being included to represent an organisation's identity. The CEO's discourse or CEO-speak is suggested to include the Annual General Meeting of shareholders, financial press releases and newsletters, corporate brochures and organisation advertisements (Catusus and Johed, 2007; Leibbrand, 2015). Numerous communication channels through social networking platforms like Facebook (Bellucci and Manetti, 2017) and LinkedIn (Goncharenko, 2019) have also begun to attract the attention of accounting scholars.

This study draws on the knowledge generated by managers engaged with sustainability and its organisational implementation encountered by them in their everyday practices, which is assumed to belong to the CEO's discourse or CEO-speak (e.g. as a particular genre within such a discourse). Instead of asking what organisational practice in sustainability development looks like, the study asks how it has been disclosed and presented by the management engaged in its practices, and whether these discourses/genres can provide a better understanding of the sustainability concept.

Managers of such sustainable organisations may have identified additional themes within a sustainability framework that they might then reveal through "managerial talk". Management presentations are considered to be accounts of business practices that are performative in the sense that they produce new insights, visions and constellations of sustainability and its reporting (Justesen and Mouritsen, 2009).

One possible argument against this approach might be that the voluntarily disclosed private managerial information could require some mechanisms to confirm its creditability (Ball *et al.*, 2012). Therefore, it is important to provide some evidence that presentations were made by representatives of sustainable organisations, and that these speeches were performed within a particular discourse community which is relevant to the purpose of the study.

3. Research design and method

3.1 Representing a “sustainable organisation” in Sweden

Within Sweden, where the research project is located, a few context-specific considerations should be mentioned. Firstly, Swedish organisations have a long history of active work in the field of sustainability. In the latest Robeco SAM Country Sustainability Ranking (2021), Sweden is ranked first out of 150 countries when assessed according to ESG indicators.

Ambitious national legislation regulating the platform for sustainable business in Sweden [3] has contributed to many Swedish organisations being at the forefront of integrating a sustainable approach to business into their strategies, daily management and reporting. The Swedish Government has also set the target of Sweden becoming the world’s first fossil-free welfare nation (Government Offices of Sweden, 2020).

Secondly, Sweden enjoys a high level of industrial development; this is accompanied by the fast adoption of new and advanced technologies at a rapid pace, including Artificial Intelligence (AI), cloud services, high performance and quantum computing. Sweden also aims to become a world-class electronics industry country regarding components and systems by 2025 (Digital Economy and Society Index (DESI), 2022).

Thirdly, the advanced financial reporting quality in Sweden and the top national rates of sustainability reporting compared with those of many other countries can be emphasised (KPMG, 2020). In 2007, Sweden became the first country in the world to introduce guidelines for external reporting on sustainability for state-owned companies following the GRI guidelines. The provisions regarding sustainability reporting in Sweden are much stricter [4] than the floor requirements of the EU Non-financial Reporting Directive 2014/95/EU. The Swedish implementation of the EU directive covers approximately 1,500 independent companies, corresponding to 45% of all employees in the private sector and 58% of all fixed assets (Swedish Agency for Growth Policy Analysis, 2018).

As demands for sustainability, compliance and the transparency of organisations have come from all corners of Swedish society, numerous professional associations have been actively establishing a legitimate voice within the sustainable development debate in Sweden, signalling their concern for, and engagement with, sustainability-related work.

The study turns to sustainable organisations that present their identity within a specific community of practice, a particular discourse community. According to Swales (1990, 2011), a discourse community is a group of people who share common goals and mechanisms of intercommunication among its members. The availability of information is also limited to those of its members who possess a suitable degree of relevant discourse expertise.

SSFA has approximately 1,100 members active in the area of qualified financial analysis within Sweden, including investors, fund managers, analysts and journalists. SSFA is also a member of the European Federation of Financial Analysts Societies (EFFAS). SSFA’s CEO traditionally acts as the Chairman of the Committee which nominates winning companies in different categories for the best annual financial reports produced by Swedish-listed companies.

Conditions for being a member of the SSFA [5] ensure a certain profile for their members and put SSFA at the centre of conceptual developments, education and organisational practice within Sweden’s sustainability debate.

SSFA members were among the first in the country to engage in sustainable development discussions; they are seen to be, and promote themselves as, organisations that are knowledgeable in sustainable development and business (SSFA, 2018). To start with, SSFA and EFFAS are responsible together for providing education services for Certified Environmental Social and Governance analysts. Secondly, SSFA reviews guidelines for financial analysis in Sweden every third year, including assessing the benchmarks for both financial and sustainability information analysis (SSFA, 2018). Finally, SSFA regularly arranges meetings where the topic of sustainability has recently been given substantial

attention. SSFA's representation in the sustainability agenda, therefore, is addressed through professional education, written analytical recommendations and management presentations.

In this article, management speeches delivered by representatives of sustainable organisations (see [Table 1](#) for various categories of participants/presenters) via the forum of the SSFA, a high-level professional setting within the sustainability debate in Sweden, are chosen for analysis. Although this particular genre ("managerial talk") has not yet been broadly applied in accounting studies, it seems to offer some potential in representing the sustainability work performed by companies/organisations.

3.2 The empirical data collection strategy

The study's implicit assumption is that presenters are knowledgeable agents ([Gioia et al., 2012](#); [Gehman et al., 2018](#)) of managerial practices concerning sustainability. The corporate and organisational activities of what are, in reality, dominant institutions of society, constitute justifiable targets for exploring and assessing sustainability ([Burritt and Schaltegger, 2010](#)).

The empirical data for this article was collected during 20 presentations delivered by senior managers from companies, the financial industry, the Swedish government and non-profit organisations to the SSFA between November 2016 and February 2020. The attention paid to the topic of sustainability has escalated at SSFA's events after the adoption of the Paris Agreement (December 2015), a legally binding international treaty on climate change, which explains a starting point for this research project. Indeed, in the 20 speeches collected for the article, this global event was repeatedly mentioned as an important historical point not only aiming to strengthen countries ability to deal with the impacts of climate change but also supporting sustainability efforts for companies and organisations. Following [Glaser and Strauss \(1967\)](#), the empirical data collection ceased once empirical saturation had been achieved (i.e. a few speeches acquired during 2020–2021 did not provide any additional data relevant to the article's research purpose).

The empirical data collection strategy was influenced significantly by the concern expressed by [Laguir et al. \(2019\)](#) regarding the databases of many sustainability papers consisting only of a single case study or interviews being restricted to those most directly working with sustainability issues. In our study, 20 presentations were given by senior managers and specialists from different types of institutions, which are framed by different organisational purposes and varying managerial practices.

There is no requirement that presenters should be members of SFF; instead, they are invited as business leaders and knowledgeable experts within the field of sustainability. The geographical focus of the presenters was not limited to Sweden; in most cases, it incorporated European and global contexts. Several presenters are also active outside their core roles, participating in international bodies and expert networks, for example.

Current literature highlights the diversity of organisations that can contribute to sustainability accounting and reporting as different stakeholders within the sustainability debate might present various perspectives ([Amernic and Craig, 2006](#); [Laine and Vinnari, 2017](#); [Adams and Larrinaga, 2019](#)). The identification of similarities across different types of organisations allowed us to search for common sustainability patterns.

Presentations chosen for the study were given without a pre-settled framework, content restrictions or any set of rules or regulations, except for a common requirement that a particular speech must contain the topic of sustainability.

Each presentation lasted approximately one and a half hours, followed by questions and discussion. Based on the panellists presentation materials (including displayed PowerPoint pictures and other support resources), we integrated the information into 20 transcript files (protocols) that provided the empirical database for this article. Additionally, any information resources to which the presenters referred during their sessions were incorporated into the protocols.

The list of participants is summarised in [Table 1](#).

N	Type of organisation	Position at the organisation	Main activities of the company/organisation (as of 1 March 2020)
1	State-owned	MLM	A government agency with the aim of ensuring access to financial solutions for the Swedish export industry
2	State-owned	TM	A government organisation which is responsible for developing, producing and disseminating official statistics in Sweden
3	State-owned	SS	A state-owned financial institution which is responsible for monetary policy and payments in the Swedish economy
4	State-owned	TM	Swedish government office
5	State-owned	SS	State-owned research and educational organisation with strong interdisciplinary research and problem-based learning
6	Joint state-private ownership	SS	A research and educational centre for sustainable finance
7	Employer association	TM	An employers' organisation with members ranging from companies providing advanced technological services to firms in the biotechnology and telecommunications sectors
8	Non-profit organisation	TM	A non-profit charity that runs a global disclosure system for investors, companies and cities to manage environmental impacts
9	Non-profit organisation	TM	A Swedish non-profit organisation that seeks to raise awareness of global catastrophic risks and the global governance necessary to address these risks
10	A private financial institution	TM	A financial institution that manages collectively-agreed occupational pension plans on behalf of corporate and private clients across Sweden
11	Financial infrastructure, privately-owned	TM	A global provider of trading, clearing, exchange technology, listing, information and public company services
12	Financial infrastructure, privately-owned	MLM	A global financial markets infrastructure business
13	Financial infrastructure, privately-owned	MLM	A leading index provider and data source for independent credit ratings
14	A private financial institution	TM	A leading Nordic banking group 1
15	A private financial institution	MLM	A leading Nordic banking group 2
16	Privately-owned service company	TM	An intermediary and advisor, raising capital for social entrepreneurs
17	Privately-owned service company	TM	A leading advisory firm, providing institutional investors and companies with advice on governance-related issues
18	Privately-owned industrial firm	MLM	A global industrial company listed on the Nasdaq stock exchange (Stockholm and New York)
19	Privately-owned financial firm	TM	A private company specialising in European equities
20	Privately-owned trade firm	TM	A private consultancy company serving international business and trade

Note(s): All presenters are employed by their respective organisations. Position at the organisation is defined as follows: Top manager (TM) – the management team of the whole organisation including job titles such as CEO, CFO, Head of Sustainability, Senior Vice-President, member of the Board; Middle-level manager (MLM) – management team heading various departments/divisions; Senior Specialist (SS) – an employee with particular knowledge and expertise within the field

Table 1.
The list of participants (presenters)

The prepared 20 protocols, which summarised the presentations of the participants, were reviewed by applying content analysis, a means of studying documentary evidence and classifying texts according to selected criteria (Beck *et al.*, 2010; Mahmood *et al.*, 2018). Content analysis was carried out in this study for two reasons: firstly, to capture the presence of the three pillars of sustainability and their respective disclosure metrics, as outlined in the theoretical review and secondly, to search for a new theme or a new paradigm of sustainability derivable from managerial practice. Content analysis is viewed as a common research tool in analysing corporate sustainability discourse (Unerman and Bennett, 2004).

The material provided by the 20 protocols was scrutinised line by line, applying variance thinking (identifying similarities and differences between variables) to explore the potential appearance of themes or categories (see Langley *et al.*, 2013) [6].

3.3 Method

An inductive method was applied to support the explorative nature of our research paper, seeking new themes and dimensions within the sustainability concept which eventually emerges outside the current box (Lukka, 2010) of a “triple bottom line” framework.

Van Maanen (1979) distinguished between first-order concepts, consisting of quotes and facts, and second-order concepts, introducing theories that permit the organisation, explanation and interpretation of these quotes and facts. The distinction is determined by whose point of view is being reported: the informant’s terms or codes, or the researcher’s centric concepts, themes and dimensions (Gehman *et al.*, 2018).

During the first step, an initial screening of the 20 transcript files to develop phrasal descriptors, or the first-order concepts, was performed (Gioia *et al.*, 2012). At that point, the vocabulary of the concepts was recited in transcripts files in equivalent words and expressions retaining managers terms. The initial screening identified 173 first-order concepts without any further distillation of categories. A sample of the first-order concepts that were developed during the initial screening of the empirical data is provided in Table 2.

Afterwards, a search was made, utilising a cross-case pattern comparison to identify similar codes per theme to reduce the instances of double coding. The purpose of this aggregation into wider concepts was to capture all relevant meanings without repetition. As an example, numerous quotes regarding AI, software technology, machine learning, robots and industry developments were assembled into the broader category of “technology” whenever these above-mentioned terms pointed to the same pattern.

The application of the broader categories enabled the 173 first-order concepts to be decreased to a more manageable set of 22. This reduction was conducted while keeping the informant’s terms or codes, as suggested by Gehman *et al.* (2018). After all the first-order concepts were identified, labelled and placed in a broader category, we further divided them into second-order categories with researcher-centric concepts, themes and dimensions (Van Maanen, 1979).

Whilst it was possible to match several identified first-order concepts with the three pillars of sustainability, a few constructs were found to require additional framing decisions. Firstly, we noted that “technology” appeared in all 20 presentations in connection with a description of a “triple bottom line” framework. Secondly, we found that technology had both negative and positive impacts on the three pillars of sustainability. Thirdly, we identified several concepts (including governance, steering, evaluation and disclosure tools) that all related to different pillars of sustainability.

After organising the data into the structured form of first-order and second-order categories, we then turned to aggregated theoretical dimensions (see Figure 1). Potential theoretical saturation of overarching themes was addressed by differentiating between second-order concepts according to their impacts (negative or positive) and functional roles with their mechanisms for developing sustainability.

Quote	First-order concept
“In Trelleborg municipality, <i>a robot</i> [instead of human beings] handles applications from citizens that require economic support due to unemployment. The introduction of the software Procapita resulted in a quicker and simplified working process. But can <i>Artificial Intelligence (AI)</i> systems <i>behave ethically</i> ? Can <i>robots be ethical</i> ?”	AI, robots and ethical behaviour
“ <i>The climate rating</i> for Atlas Copco is 74, accompanied by emissions of 45 CO2 kg/year, while Volvo with the same <i>climate rating</i> of 74 has emissions of 70 CO2 kg/year. Although <i>climate ratings</i> are the same, the impact is different depending on the <i>industry</i> .”	Climate ratings are industry-related
“ <i>Digitalisation</i> started to <i>impact our business model</i> and its respective <i>KPIs</i> . It was common before, and even now, to report <i>the metric</i> ‘diversity and inclusion’. Nowadays, access and affordability have been enhanced through <i>digitalisation</i> ; therefore, <i>the new metric</i> ‘digital inclusion’ has been <i>introduced</i> .”	Digitalisation and the business model; introduction of new metrics and KPIs
“ <i>Bloggers on social media</i> started to be a problem through undesired impacts on stock trading by <i>communication of false news</i> . During 2014–2015 the first case was registered in Sweden when a person was convicted by the court due to the illegal impact on stock prices for their benefit through writing comments on a stock forum online.”	Communication of false news by bloggers on social media
“What happens when the customer wants the functionality of the product, but not necessarily the product itself? After downloading the mobile app ‘Husqvarna Battery Box’, the customer can <i>rent</i> one of the 30 tools (chainsaw, hedge clipper, trimmer or leaf blower) for SEK 350 per day. It is an <i>example</i> of when a <i>technical solution</i> enables a <i>resource-saving strategy</i> .”	An example of a resource-saving strategy through renting, introduced through a technical solution
Note(s): It is not the intention of this paper to report on the entirety of the formation of the first-order concepts in detail but rather to show, as far as is possible, how the method described assists the capture of presenters’ content information in a transparent way	

Table 2. Examples of first-order concepts identified from initial screening

Finally, we transformed the “static data structure into a dynamic inductive model” (Gioia *et al.*, 2012, p. 24) by suggesting how uncertainty regarding technology’s impact on the three pillars of sustainability can be directed through various steering mechanisms towards a targeted positive outcome. (see Figure 3 for details related to the suggested inductive model).

4. Empirical presentation of the data structure

The study’s data structure consists of 22 first-order concepts (reduced from an initial 173 concepts) and 8 second-order theoretical structures that emerged from the first-order concepts. Presented in Figure 1, the structure summarises the empirical data that was prepared using the Van Maanen (1979) and Gioia *et al.* (2012) methodologies.

Mindful of nuances captured by the first-order and second-order items, we continued making comparisons until, finally, three aggregate dimensions: “negative impact”, “positive impact” and “functional steering mechanisms”, were produced (see Figure 2).

5. Analysis and findings

This section presents an analysis of the created data structure. The observations are organised according to the aggregate dimensions and respective second-order categories that emerged from the data analysis process summarised in Figures 1 and 2.

5.1 The “negative outcome” dimension

The first aggregate dimension of the data structure is “negative outcome”. This comprises three categories: (1) technology as a possible interference with the environmental pillar; (2)

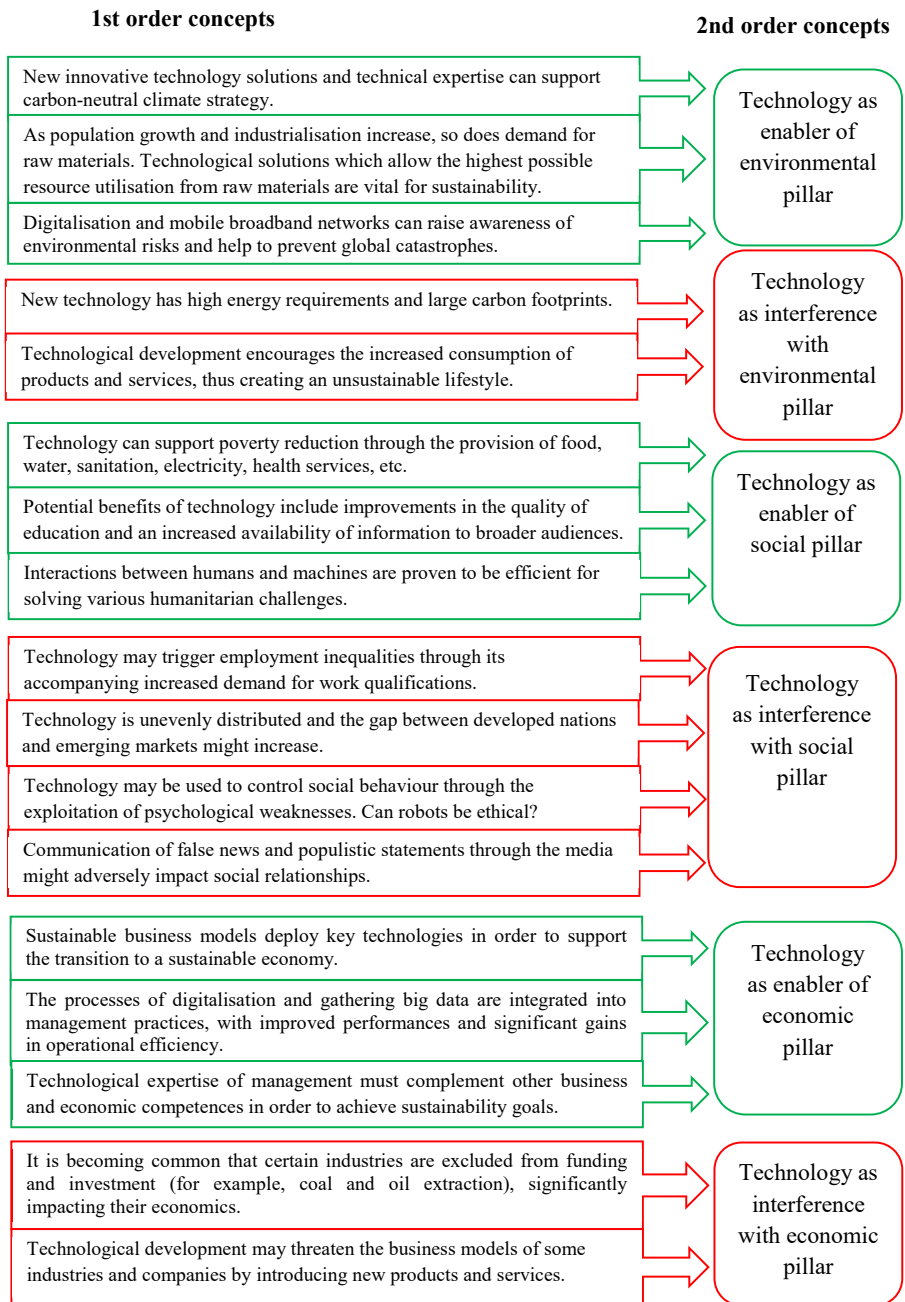


Figure 1.
Data structure: first-order and second-order concepts

(continued)

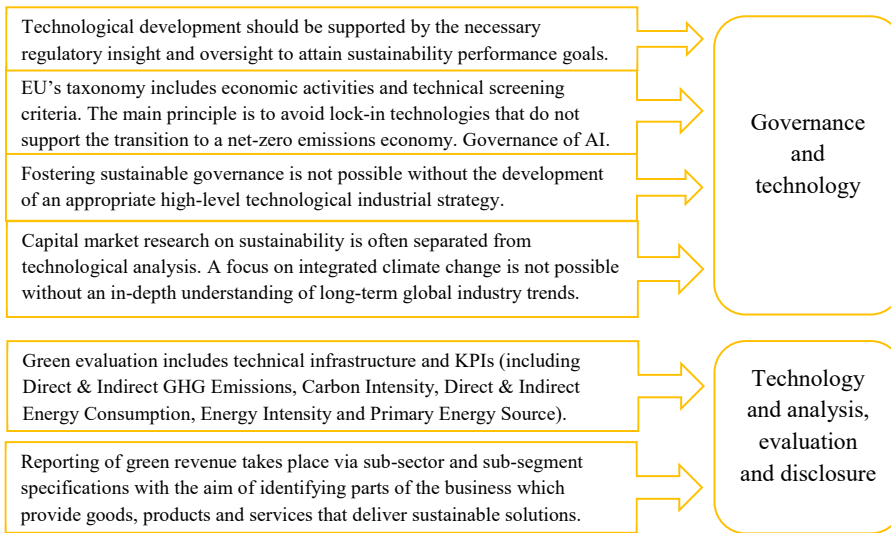


Figure 1.

2nd order concepts

Aggregate Dimensions

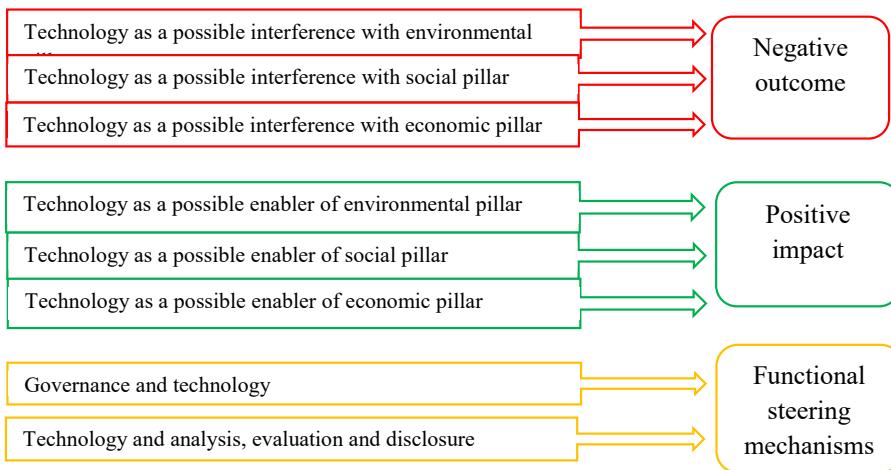


Figure 2. Data structure: second-order concepts and aggregate dimensions

technology as a possible interference with the social pillar and (3) technology as a possible interference with the economic pillar.

Several managers expressed concerns regarding the possible negative impacts that new technology might have on the environment. One major risk is that advanced technology may demand large amounts of energy resources, creating substantial carbon emissions. *“Cryptocurrency applications such as Bitcoin use as much electricity as some nations’ electrical demand. Some estimates suggest that the total electricity demand for information and communications technologies could require up to 20% of the global electricity demand by 2030,*

from around 1% today. A human brain obviously consumes much less energy than a large computing centre,” pointed out one of the presenters.

The encouragement by the technological development of increased consumption of products and services also runs counter to an ecological lifestyle. *“If all the inhabitants of the Earth would live like us Swedes, we would need more than four Earths. And we do not have them,”* concluded a manager. These comments were made in the context of addressing the vital importance of reducing consumption despite innovative technology temptingly offering additional products and services.

A possible negative impact of technology on the social pillar has been proposed by many presenters. As a starting point, technology may trigger employment issues in the labour market. *“A possible scenario to consider is that every second job will be automatised within the next 20 years. This is a challenge for Sweden, but also for other countries,”* commented one expert.

Furthermore, by replacing traditional jobs with new ones that require more skills, technology might disproportionately reward educated people or particular subgroups of a population. *“Young persons in Sweden aged 16–24 years use the Internet daily to a greater extent than older persons. A relatively large share of persons aged 55–74 years has seldom used the Internet. This poses a risk of social exclusion and lack of participation, in particular among foreign born persons and older persons,”* explained a government official.

Another important drawback of technological developments is that they are traditionally based on the needs and values of developed nations rather than those of emerging markets. If technological resources are not equally available in all countries, the socio-economic gap between nations might widen significantly as such inequalities continue to evolve.

The social impact of the introduction of AI and robots, including human–robot collaboration and its possible exploitation, is far from being clarified. *“Can robots behave ethically?”* asked a presenter. While an answer to this question remains unclear, there is an obvious threat that technology can be used to control people’s social behaviour through the exploitation of psychological weaknesses.

Swedish company Fingerprint AB provided an example of a possible negative impact of digitalisation on stock market communications. *“On October 11, 2013, Cision, a news distributor, sent a press release that Samsung Electronics would acquire Fingerprint Cards AB. After releasing this information, the share price increased from 53 SEK to 79 SEK. Fingerprint’s CEO contacted surveillance and was informed that the press release was false. After further investigation, it was found that Cision had received an email with the press release from a person posing as the CEO. A new press release was issued by Fingerprint stating that the earlier press release was false. Cision sent a press release declaring that they had been the victim of fraud and filed a police report.”* It seems, therefore that communication of false (“fake”) news and populist statements through the various media risks negatively impacting social relationships.

Finally, technology can interfere with the objectives of the economic pillar. Increasingly commonly, certain industries are excluded from funding and investments, which in turn significantly impacts their business model. *“Lending for coal-fired power is not permitted. In exceptional cases, loans may be offered for measures aimed at improving the environment. Gross lending to fossil operations (coal, oil and gas) should be less than 5% of our total lending portfolio,”* explained a banking executive during the presentation of a newly revised climate policy.

Innovative technology may bring about further impacts as substitutions of new products and services for existing ones threaten the business models of particular industries and companies. One manager reflected on the history of Kodak during their presentation of industry analysis: *“Let’s take [the] example of Kodak, a 130-year old photographic film pioneer. In the 1980s Kodak employed about 128,000 persons worldwide, had a revenue of USD 9.7 billion and disclosed profits of USD 1.1 USD billion. Due to several cost-cuttings and*

the introduction of new products (filmless photography, professional digital camera systems etc.), Kodak managed to reach in 1995 a revenue of USD 15 billion and profits of USD 1.3 billion. However, starting from 2005, Kodak lost its competition against mobile phones with cameras. As a result, Kodak filed for Chapter 11 bankruptcy protection on January 19th, 2012.” In this example, the long-term economic sustainability of Kodak was completely destroyed by technological evolution as mobile phones with cameras replaced traditional cameras.

5.2 The “positive impact” dimension

The second aggregate dimension of the data structure is “positive impact”, which consists of three categories: (1) technology as a possible enabler of the environmental pillar; (2) technology as a possible enabler of the social pillar and (3) technology as a possible enabler of the economic pillar.

According to our presenters, new and innovative technology solutions can support a carbon-neutral climate strategy. “Our long-term climate strategy is to be carbon neutral by 2040 in all our investments, and now we are working on segmenting targets (KPIs) with a relevant technology employed for each investment area,” explained a financial manager. Furthermore, special attention was given to technical expertise: “Rigorous and ambitious sustainability performance goals can be achieved only through technical expertise, experience and track record of success. Errors in technical expertise can lead to substantial fines or penalties and weakened competitive position versus peers.”

As population growth and industrialisation increase, so does the demand for raw materials and energy. Technological solutions which allow the highest possible utilisation of resources are vital for sustainability. “Emission of greenhouse gases within Sweden has decreased over the years, among others due to factors such as altered energy sources for heating of homes and real estate,” noted a government officer. Another example mentioned – that of the Swedish industry exploiting recycled plastic – demonstrates the potential reductions in consumption rates of raw materials. Today, a vacuum cleaner produced by the Swedish white goods giant Electrolux consists of up to 70% recycled material.

Finally, digitalisation and mobile broadband networks were highlighted as a means of raising awareness about environmental risks in order to avert global catastrophes. One senior executive stated, “Evidence-based decision-making about the environment should use reliable statistics and quality data. That is even more important today when many people use ‘alternative facts’ collected from Facebook and Instagram. Increased requirements for the availability and consistency of environmental data are necessary to manage and monitor environmental risks and sustainable developments.”

Technology was envisaged by several speakers as an enabler of the social pillar of sustainability. It can support poverty reduction by the provision of food, water, sanitation, electricity, health services and other needs. “It is important to maximise the potential benefits from AI, including quality education and availability of information to a broader audience,” stated a manager of a non-profit organisation.

Furthermore, human-machine interactions are also proven to be efficient when solving various humanitarian challenges. One example cited by a manager referred was that the lowest error rates in the diagnosis of lymph node cancers have been achieved through the combined efforts of human beings and machines; they underperform substantially by comparison if they work independently of each other.

Concerning the economic pillar, an organisation’s business model should deploy key technologies and innovative products to support the transition to a sustainable economy. One executive concluded, “Global markets will demand sustainable high-tech circular solutions. It’s in this world Sweden’s businesses and Sweden as a small export country should be competitive.”

The processes of digitalisation and gathering big data may be integrated into management practices, performance improvement strategies and significantly increased operational efficiencies. *“Digitalisation, AI with machine learning and the introduction of robots will impact the performance of organisations,”* suggested an executive. Furthermore, cyber- and information security and data protection are viewed by several managers as enablers of companies and organisations long-term economic sustainability.

The technological expertise of management is also an essential complement of business and economic competencies for the achievement of sustainability goals. *“I would rather talk about expertise in concrete products, projects and activities that they lead to than overarching sustainability frameworks. I mean knowing about energy and material efficiency, improving the reliability of our products and increasing their service life, both in our own business and that of our suppliers and customers,”* explained a manager.

It appears that managements view technology as an important driving force for all three pillars of sustainability. *“The long-term strategy shall include innovation culture and technological development,”* concluded one of the executives.

5.3 The “functional steering mechanisms” dimension

The third aggregate dimension of the data structure is “functional steering mechanisms”, comprising two categories: (1) governance and (2) analysis, evaluation and disclosure.

Technological development must be supported by the necessary regulatory insight and oversight to enable sustainability goals. *“Current EU rules regarding institutional investors and asset managers having to consider sustainability factors and risks in the investment decision process are different across sectors. Whether they shall be consistent or not is not clear,”* commented a financial industry presenter.

Global agreements and international industry-related standards for products traded worldwide need to be developed. For example, *“EU waste legislation, where broken products are classified as waste, constitutes an obstacle to trading with second-hand products.”* Establishing EU labelling for green products that comply with green or low-carbon criteria has been identified as a vital priority.

The EU’s current taxonomy agenda includes economic activities and technical screening criteria. The main principle is to avoid those lock-in technologies which do not support the transition to a net-zero emissions economy. *“Our green loan portfolio classified by sector includes renewable energy, sustainable forestry, green buildings, clean transportation, energy efficiency and water and waste-water management,”* explained a banker. Where necessary, technology-specific considerations should be incorporated into secondary metrics and thresholds.

The rapid development of AI needs to be supported by laws and regulations that steer AI-based technologies towards sustainability. One specialist asserted, *“We need laws that protect users and yet accelerate R&D [research and development] and utilisation of AI. Failure to do so could result in gaps in transparency, safety, and ethical standards.”*

According to the study’s sampled managers, fostering sustainable governance is only possible if a proper high technological industrial strategy is put in place. Interestingly, developing such a strategy to achieve sustainability targets requires both an overview of competitive advantages and cooperation with rivals to achieve sustainability targets. *“Our ambition is to be a leader in sustainable investments, but if we want to develop industry’s benchmarks that include sustainability targets, this can be achieved only if our competitors move in the same direction,”* observed an investment manager.

Analysis, evaluation and disclosure are important tools in steering sustainability developments. It was pointed out that the capital market’s research on sustainability is often conducted independently of any technological analysis. Managers stressed that an integrated

focus on climate is impossible to achieve without having an in-depth understanding of the long-term global industry trends.

Green evaluation includes technical infrastructure and relevant KPIs: direct and indirect GHG emissions, carbon intensity, direct and indirect energy consumption, energy intensity, and primary energy sources were mentioned, among others, by managers. Responsibility for the whole production chain is a challenging task for Swedish multinational enterprises. “*Real sustainability should be explained in terms of KPIs for the whole supply chain,*” suggested a manager. Different sustainability metrics have been defined and tested, including requirements for handling chemicals, accident prevention, incident follow-up, management competence, and employment contracts reflecting working hours, wages and benefits, and health and safety standards. The same requirements and metrics apply to organisational sub-levels such as suppliers.

Presenters argued that benchmarks for green evaluations can be industry related. In an overview of green assessment methodology, a financial executive explained, “*In our assessment, fossil fuels/low-carbon technology exposure stands for 50% of assessments’ output while emission intensity and climate management performance represent 50% each in the final score. A category ‘fossil fuels/low-carbon technology exposure’ is represented by several metrics like power production capacity (coal/renewable production), clean energy share (in product components and equipment) and fossil fuel reserves (current level compared to the target one).*”

Special attention was given to reporting green revenues. “*Investors want to understand how well companies are managing the risks associated with sustainability issues, seeing this as a key test of management quality,*” explained a manager. Green revenue reporting happens commonly through sub-sector and sub-segment specifications to identify parts of the business (goods, products and services) that deliver sustainable solutions and support the transition to a green economy.

6. Critical reflection and the introduction of an inductive model

The data structure presented in [Figures 1 and 2](#), with its three theoretical dimensions (“negative outcome”, “positive impact” and “functional steering mechanisms”), is static. It does not account for the flows of events over time, and interactions between suggested concepts are unclear. This is consistent with the methodology developed by [Gioia et al. \(2012\)](#). To create an inductive model, we have to change our approach from variable to process thinking (see [Langley et al., 2013](#)), aiming to explain how uncertainty regarding technology’s impact on sustainability can be directed towards a targeted outcome (i.e. when technology facilitates sustainable development).

Firstly, we consulted the relevant literature again in order to refine articulation of the three emergent concepts and the relationships between them. The guidance is derived primarily from the literature concerning MCS and sustainability ([Gond et al., 2012](#); [Laguir et al., 2019](#)). This material highlights the importance of guidance and steering rules for fostering the integration and implementation of the three pillars of sustainability. Another revisited literature at that point was a few articles related to sustainability and technology, which highlights the paradoxical features of their relationships and motivates the search for solutions on governing technology to facilitate sustainable development.

Secondly, we were inspired by one of the presenters, a government official, who drew attention to the uncertainty associated with the possible introduction of an e-krona in Sweden. While currency digitalisation provides enormous resource savings and opportunities to optimise processes, several major risks have been identified that might negatively impact monetary policy, economic and financial systems. An appropriate pilot project might, it is suggested, identify mechanisms that would guide the introduction of an e-krona towards targeted outcomes.

Guided by both the literature covering contradictions between technology, MCS and sustainability and the example of a pilot project investigating conditions for the introduction of electronic Swedish currency, the first-order and second-order concepts were reviewed to determine whether the qualities captured by a “negative outcome” may be reversed to bring about a “positive impact”.

As an example, one potential negative impact of technology on sustainability is that communication of false news and populist statements through online media might adversely affect social relationships. Functional steering mechanisms, on the other hand, can be applied to mitigate such negative impacts and positively enhance social relationships via communication technologies. It does appear that the negative and positive qualities which can be extracted from the first-order and second-order concepts are interdependent. They are also movable and exchangeable, depending on whether these concepts are actively managed or not. Through the data structure analysis, a dynamic affinity between negative and positive outcomes was observed; and the underlying links between these malleable constructs were suggested to be directed through applicable steering mechanisms.

The vibrant inductive model (Figure 3) arising from the data analysis structure summarises the key findings of the analysis itself. The model contains the three pillars of sustainability (derived from the research literature and regulations) and introduces technology as a component of the sustainability framework. The model emphasises that technology can be both an enabler of, and an interference with, sustainability depending upon how steering mechanisms (governance and regulations, analysis and evaluation tools, and disclosure practices) are applied.

Regarding a proposed inductive model, the three pillars of sustainability provided a reference framework for researching additional themes and dimensions outside the traditional sustainability concept presented in the literature and regulations. The existing “triple bottom line” scheme with environmental, social and economic pillars guided the study towards a nascent concept (Gioia *et al.*, 2012) of technology, a part of the sustainability framework, as suggested by this article. In other words, when additions to the sustainability framework were considered, the main complementing factor that emerged was the role of technology. Technology seems to be a common theme or dimension in the article’s empirical dataset framed by differing organisational purposes and managerial practices.

When technology as an interference with the three pillars is transformed instead into an enabler of sustainability, then contradictions that have been pointed out by researchers in

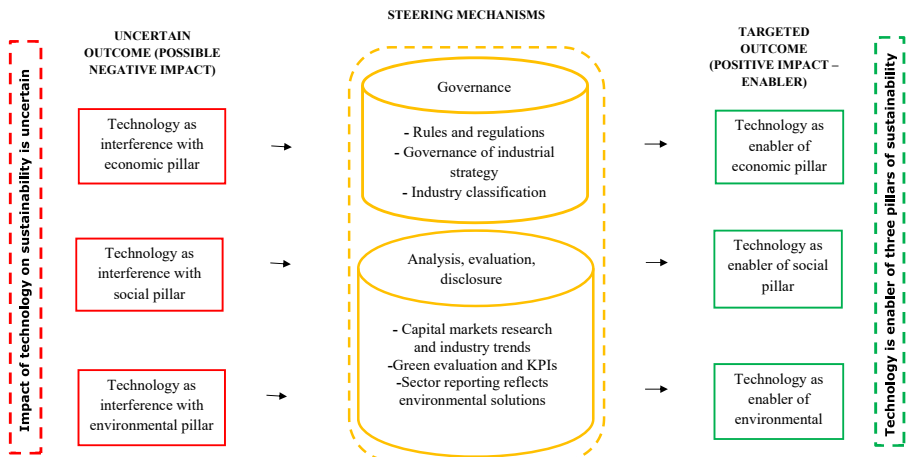


Figure 3. A proposed inductive model that avoids negative impacts on the three pillars of sustainability by deploying steering mechanisms to direct technology towards positive outcomes

connection with the implementation of the integrated approach may be reduced or even removed. Importantly, in managing the tensions within the sustainability framework, a key role can be played by governance structures and regulations, analytical and evaluation tools, and measurement and reporting systems, all of which could be designed according to the targeted sustainability goals.

7. Discussion and conclusions

About 40 years have passed since the WCED and IUCN reports were published, drawing worldwide attention to the need for sustainable development. During these years, three dimensions – environmental (a responsible relationship between man and nature); social (a value creation for organisations and society) and economic (long-term economic and financial performance) – have been guiding public policies, research and managerial enactments of sustainability. In this study, a “triple bottom line” structure, arising out of regulations and academic papers, has been a dominant theme which united all 20 presentations conducted by senior managers and experts for the SSFA between November 2016 and February 2020.

The study’s contributions include the introduction of a new theme (i.e. technology) for the sustainability framework and the suggestion of dynamic interrelationships existing between technology and the three pillars of sustainability. It seems that technological efficiency improvements, solely driven by profit-seeking industrial development, will not necessarily improve sustainability (Sorrell, 2009; Hansson, 2010). Long-term solutions to the Jevons (1865) paradox cannot be achieved by technological innovations alone but probably require a continuous process of institutional and behavioural adjustments (York and McGee, 2016; Giampietro and Mayumi, 2018). Although the idea of designing technology according to social values is not a new one (Ludwig, 1997; Johnson and Wetmore, 2009), the “social side” of technology has not yet been properly acknowledged and explored by academic scholars (Paredis, 2011).

The incorporation of technology into a sustainability framework is neither a quick nor a simple solution. The challenge is often related not only to individual technologies or products but is also commonly interconnected with conflict situations between innovative technologies and available resources, current and future patterns of production and consumption, and various social and political interests. In this context, technology might be an exciting topic for future research, especially considering that modern technology is inseparably connected with both the development and business models of organisations and, according to this study, is also related to all three pillars of sustainability.

To achieve the sustainable application of technical solutions and avoid undesirable side effects (Ludwig, 1997), assessment and accountability of technology should be assured by all the relevant stakeholders. For politicians and public servants, it might be worth evaluating which societal and organisational conditions could serve as incentives for the development of innovative technology as a contribution to sustainability. Future academic scholars, from their side, can map and analyse the contradictory evidence provided by various organisational accounts when both technology and sustainability terms are included in the analysis.

Which accounting methods can be used to assess whether and to which extent the use of technology could result in “more” or “less” sustainability? How financial values and accounting techniques influence technologies? How reliable are the sustainability assessments metrics of technology? Despite an obvious concern that a broad sustainability focus might be accompanied by complexity, transdisciplinary research seems to have an enormous potential for the fields of sustainability, technology and the accounting discipline.

Based upon the outcomes of this study, governing technology to achieve sustainability goals is vitally important, and may be exercised through the application of regulations,

analysis and evaluation tools, and appropriate disclosure practices. In contrast, the absence of an active steering strategy might result in significant delays and hinder the implementation of all three pillars of sustainability; importantly, therefore, consideration of this last point is strongly recommended for the decision-makers.

The inclusion of technology might substantially raise the requirements for corporate accounting and reporting and also increase its importance. Accounting should be sufficiently flexible both to reflect continuous changes in technologies and to assist in steering future innovations into sustainable directions. As pointed out by [Burritt and Schaltegger \(2014\)](#), a narrow focus on partial accounts can hardly bring new solutions. Accounting, as a consequence, needs to develop beyond its current scope if it wishes to retain and increase its relevance. Accounting for sustainability might not be limited to sustainability accounting and reporting, a thesis that needs further investigation.

How can accounting be conducted to contribute to conceptual development and the implementation of sustainability? The exploration of accounting craft as a method theory ([Lukka, 2005](#)) in this study has demonstrated its capacity to enhance the development of another academic field of interest, i.e. the sustainability concept. How do the interactions between accounting (as a method theory) and sustainability (as a domain theory) shape our understanding of these two disciplines over time? In interdisciplinary research, it is claimed that method theories play a corresponding role since their purpose is to assist the researcher in producing a contribution to a domain theory ([Lukka and Vinnari, 2014](#)).

This study suggests that accounting might be an analytically viable tool to study the field of sustainability; however, it might be too early to conclude that accounting has contributed to the domain theory without being developed itself. Accounting can seldom be developed alone but commonly requires a symbiosis with other disciplines. The evolving accounting functions and additional discourses/genres might emerge at the boundaries between studies in the areas of sustainability, technology and accounting.

One possible direction for the evolution of accounting includes the enhancement of flexibility and dynamism of its discourses/genres, a condition which is vital for an appropriate representation of rapid technological developments. In the article, a disclosure through “managerial talk” offers potential both for the conceptual development of sustainability and for bridging the gap between accounting representations and practice. An important reminder emerging from our analysis is that representations through speeches of managers (“managerial talk”) do matter, as suggested by [Amernic and Craig \(2017\)](#).

Representing “sustainable organisations” within a particular discourse community (in our study, SSFA) creates new possibilities for studying “managerial talk” as a sustainability genre and ensures that obtained discretionary signals (i.e. relevant and private) are useful for managers and academic scholars. The analysis indicates that, by identifying themselves as leaders in sustainable development with a right to speak ([Tregidga et al., 2014](#)), managers of studied organisations have things to report and messages to send during a societal sustainability debate.

Increased pressures brought about by national and international regulations (and society generally) are gradually forcing organisations and companies to incorporate principles of sustainability within their strategies, structures and management systems. To disregard this understanding and development of the sustainability concept might impose a serious limitation, if not prove to be an outright error. Potentially, organisational managers with relevant sustainability experience can have an active part, participating together with scholars in the formation of new evolving discourses/genres, representing sustainability.

Many scholars have highlighted the urgency of strengthening links between theory and practice by translating the outcomes of academic studies into the realities of companies and organisations ([Hopwood, 1983](#); [Schaltegger et al., 2015](#); [Lueg and Radlach, 2016](#)). While there is a need for academic researchers to focus on findings that have a direct practical relevance

(Baldvinsdottir *et al.*, 2010), there might also exist the opportunity to connect academic research with managerial praxis. Practitioner knowledge and judgement regarding sustainability may update implementation specifics and assist the search for new themes and dimensions within sustainability frameworks.

In this article, exploiting management accounts from different organisational settings, we have demonstrated the possibilities of developing and enriching the concept of sustainability through the inclusion of technology. Future scholars may further bridge the disciplinary boundaries between the natural, technical and social sciences and link technical developments to (better) sustainable development via accounting tools. As an example, researchers can contribute through various accounting disclosures to the debate around sustainable solutions where the Jevons (or other technological) paradoxes could be successfully avoided or minimised.

There are a few limitations to this study. Firstly, the article provides some insights into how representations through managerial speeches can develop and enhance the organisational discourse of sustainable development. The extent to which sustainability discourses through “managerial talk” may ensure a true representation of organisational practice is difficult to judge. Such a question can be posed even though few, if any, would claim that a complete representation of sustainability performance is possible (Ball *et al.*, 2012). The paper does not suggest that “managerial talk” is necessarily unique or better than other genres. Additionally, what has been analysed is not exhaustive but indicative and initial. The study merely scratches the surface of the rich phenomenon of the technology disclosed through “managerial talk”; this is far removed from fully discovering the potential that such discourse/genre might offer for scholars, business leaders and policymakers.

Secondly, the study’s empirical setting is intended to contribute towards a cumulative understanding of sustainability by facilitating the elimination of strong biases about sampling and data collection, primarily drawing from annual reports (Gray, 2010; Comynsa *et al.*, 2013) and individual cases (Laguir *et al.*, 2019). Whether the inclusion of management accounts from public, private and not-for-profit organisations enables us to fully eliminate idiosyncrasies attached to ownership types and different industries is uncertain (and may never be resolved completely).

Thirdly, the proposed inductive model does not intend to present the final word on the relationships between technology and sustainability; rather, this topic deserves substantial further efforts from academic scholars with cross-border expertise. Notwithstanding the early stage of the model’s development, the suggested incorporation of technology into a “triple bottom line” framework can be a useful departure point for research and policy considerations on the issue.

Finally, due to space limitations, many theories/concepts that have been briefly presented in the article, deserve a much more detailed consideration. This study contributes to the debate about sustainability discourses by synergies that are obtained through different theoretical areas: sustainability, technology and accounting. Interdisciplinary studies, which require the incorporation of theoretical contributions and empirical evidence from several disciplines may, unfortunately, yet inevitably, suffer from a less comprehensive overview of each subject.

The article’s effort to advance the concept of sustainability through the inclusion of technology via management practices may encourage and assist researchers and practitioners in their continuing debates regarding sustainability frameworks.

Notes

1. The Jevons Paradox (labelled as a “rebound effect” in Economics) commonly refers to any circumstance where efficiency improves by X% but resource consumption simultaneously decreases by something less than X% or increases (Sorrell, 2009).

2. <https://www.globalreporting.org/standards/gri-standards-download-center/>
3. In 2013, the Swedish Government presented an initial platform for sustainable business (UD2016/06097/FH) followed by presentation of the "Policy for sustainable business (2015/16:69)". In 2015, the Government also adopted a national action plan for business and human rights (UD2015/3494/IH). In 2018, there was a follow-up to the action plan (UD2017/21086/FH). Source: [Government Offices of Sweden \(2020\)](#).
4. Companies in Sweden that meet two of the following three criteria should include a sustainability report: (1) the average number of employees in the firm during each of the last two fiscal years amounted to more than 250; (2) the company reported total assets for each of the last two financial years amounting to more than SEK 175 million and (3) the company reported net sales for each of the last two fiscal years amounting to SEK 350 million. Source: [Swedish Government \(2015\)](#).
5. These requirements include having at least one year of practical experience in the area of financial analysis; acquiring recommendations from two existing members of SSFA; accepting the ethical guidelines for members; and being approved formally by the Board of Directors of the SSFA.
6. Process thinking is based on flows of events over time; in contrast, the variance thinking in our study examined relationships (both similarities and differences) between variables (see [Langley et al., 2013](#)).

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