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Master thesis

How does Integrated Reporting support managers to navigate for Cross-Scale Resilience?

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Disclaimer

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Executive Summary

Background: Anthropogenic climate change threatens to push Social-Ecological Systems (SESs) to the brink of their threshold limits. Without efforts to increase their resilience, we can expect more frequent and severe climate-related disasters before reaching a point of irreversible planetary damage. Organisations will need to embrace SES properties and work on their governance structures to enhance the resilience of ecosystem services. Integrated Reporting is considered the future of corporate reporting, one that brings together financial and non-financial aspects of an organisation's performance in a single report. In the field of IR, relatively little research has addressed the notion of managing resilience. It remains ambiguous how IR can be used by managers to strengthen the resilience of the SES in which their organisations are embedded. Extant literature remains conceptual and lacks empirical studies applying a cross-scale perspective.

Purpose: This research aims to investigate how IR supports managers to navigate for Cross-Scale Resilience (C-SR).

Method: A grounded theory approach is employed. Semi-structured interviews are conducted with a selection of IR and sustainability managers, and consultants applying IR. Publicly disclosed annual integrated reports are complemented with the data.

Findings: The findings reveal that IR can indirectly support the management of resilience across scales since IR drives awareness of the organisation's double materiality, tightens feedback loops through stakeholder engagement, and encourages adaptive management practices. Therefore, IR can be a mechanism to strengthen organisations' adaptability to influence the resilience of SES.

Nevertheless, the study also finds that IR remains centred on optimising organisational resilience and inadequately provides managers with vital information concerning interactions of the ecosystem services, threshold limits, and the precariousness of SESs. In turn, IR can leave out important system cues and does not foster a complex adaptive systems perspective. It is concluded that IR can only partially support managers to navigate for C-SR. Theoretically, this research contributes to a growing body of literature on how organisations build C-SR by exploring the role of IR as a management mechanism in this practice. Advancing the scientific understanding, this research finds that IR can build diversity and redundancy into governance systems which strengthens organisational adaptive capacity.

Recommendations: This research offers relevant practical implications for managers navigating resilience. Managers are recommended to embed their IR findings in their business operations and management approach to allow for increased adaptability in their organisation. Moreover, managers are best to incorporate IR with other sustainability mechanisms to ensure they gain a holistic understanding of how their organisation may manage and respond to resilience across scales of SESs.

Limited sample size, single country focus, and a subjective selection approach are critical limitations of this research. Future research adopting a grounded approach is advised to garner a larger pool of diverse participants and encouraged to explore the phenomena in different geographical and sectorial settings. Finally, it would be interesting for future research to examine practices alongside IR that would complement managers' ability to navigate for C-SR.

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C-SR – Cross-Scale Resilience
IIRC – International Integrated Reporting Council
IR – Integrated Reporting
SES – Social-Ecological System

"COVID-19 has exposed the fragility of our societies to global shocks, such as disease or the climate crisis. As we recover, we must build a better future for all. Together, we can protect our planet, improve health, reduce inequality & re-energize struggling economies." – António Guterres (2020), United Nations Secretary-General.

1. Introduction

There is mounting evidence that human activities have pushed numerous SESs beyond critical limits and carrying capacities, thereby destabilising the Earth system on a planetary scale (Rockström et al., 2009; Steffen et al., 2015). There is an urgent need for SESs to be accounted for and more resilient. Social-ecological resilience can be defined as "the capacity of a system to absorb disturbance without shifting to another regime" (Walker and Sale, 2006, p.37). Since business activities play an important role in this context, changing the way business is done will be necessary to deal with the challenges of environmental degradation (Hoffman, 2018; World Economic Forum, 2020). Accordingly, a growing body of literature describes how firms can support social-ecological resilience (Clément & Rivera, 2017; Dentoni, Pinkse & Lubberink, 2021; Howard-Grenville & Lahneman, 2021; Williams et al., 2021).

Williams et al., (2021) for example recognise that organisational long-term survival is dependent upon the resilience of the broader SES in which firms are embedded in. This is because the actions in one system can influence the "behaviour and resilience" of others across scales (Williams et al., 2021, p.9). In turn, C-SR can be defined as "a nested systems analysis of resilience" (Williams et al., 2021, p.9). Academics have begun to address the lack of interdisciplinary research integrating findings from natural sciences into organisational theory (Linnenluecke et al., 2013). However, most of the above social-ecological resilience literature remains theoretical and is lacking empirical underpinning. Scholars are invited to explore further methods by which managers can understand cross-scale connections and implement organisational strategies that foster social-ecological resilience (Williams et al., 2021).

Furthermore, firms increasingly recognize the need to find ways to help manage for C-SR (Dentoni et al., 2021; Linnenluecke, 2015; A. Williams et al., 2017; Williams et al., 2021;). Integrated Reporting (IR) has been suggested as one such mechanism for companies (Barth et al., 2017; Perego et al., 2016; Stubbs, and Higgins, 2014). According to some, IR is considered the latest reporting innovation combining financial and non-financial disclosures of a company's performance into one report (IIRC, 2021; Simnett & Huggins, 2015). The International Integrated Reporting Council (IIRC) defines IR as "a concise communication about how an organisation's strategy, governance, performance, and prospects, in the context of its external environment, lead to the creation, preservation or erosion of value over the short, medium and long term" (IIRC, 2021, p.10). In this sense, the IR framework offers an opportunity to integrate sustainability into "corporate objectives and reporting practices" (Perego, Kennedy, & Whiteman, 2016, p.1; Adams, 2013).

Moreover, scholars who have studied IR have been interested in its role as an external communication tool, the change processes induced by IR (Perego, Kennedy, & Whiteman, 2016; Stubbs & Higgins, 2014), and the adoption methodologies of IR (Vesty, Ren & Ji, 2018). Studies have also considered if IR helps firms to manage for sustainability. For example, Churet and Eccles (2014) find a strong relationship between the practice of integrated reporting and the quality of environmental, social, and governance management. Omran, Zaid & Dwekat (2020) further support the sentiment that high-quality IR practices are part of the overall environmentally responsible corporate strategy and can therefore help alleviate the negative

impact of the firms' activities on the ecosystem. In this way, IR can allow an organisation to have a more holistic understanding of the social and ecological systems. However, to date, there is lacking evidence to support if and how firms can use IR to advance C-SR. Researchers call for the investigation of how IR can effectively enhance social-ecological resilience (Williams, 2018; Williams et al., 2017). Consequently, the purpose of this thesis is to investigate the following research question:

'How does integrated reporting support managers to navigate for cross-scale resilience?'

To explore the use of IR as a mechanism for managing C-SR, a qualitative grounded theory approach is employed. In this study, semi-structured interviews will be conducted in a selection of Dutch organisations. With the chosen methodology, this research aims to contribute to a growing body of literature exploring the relationship between IR and C-SR with the possibility of identifying the dynamics that foster or inhibit this mechanism. Additionally, this research offers practical implications for managers navigating change in a rising ecological crisis. Therefore, firms must understand their role within an intertwined network of SESs to ensure both prosperity and longevity of their businesses. The insights drawn from the findings can offer managers a better understanding of the extent to which IR may support them in adopting sustainable business models and strategies.

This thesis is organised as follows: comprising of five chapters, the following section provides a comprehensive literature review of IR and C-SR, supported by their definitions. Thereafter, the methodology applied to collect, analyse, and evaluate the data is detailed. Then comes the findings revealing the most prominent data. This is followed by a discussion upon the findings, in which the literature grounds this study within previous academic papers. Finally, the conclusion summarizes the entire work and draws attention to limitations, managerial implications, and possibilities for future research.

2. Literature Review

In this section, published research on the topic of IR and C-SR is discussed. Firstly, the groundwork will be laid out explaining resilience, SES, complex adaptive systems, and resilience thinking in the context of organisations. Secondly, the topics IR, its purpose as a mechanism for management, and how IR can help manage for resilience are reviewed.

2.1. Cross-scale resilience nested in social-ecological systems

The intellectual lineage of social-ecological resilience thinking lies in the natural science theory initially formulated by Holling (1986). A SES "is a system in which people depend on resources provided by ecosystems, and ecosystem dynamics are influenced, to a varying degree by human activities" (Chapin et al., 2009, p.2). SESs are complex adaptive systems in which interconnected components can adjust and reorganise in response to disturbances and change, such as climate change, floods, urbanization, or economic inequality (Biggs, Schlüter, & Schoon, 2015). Because all SESs in the real-world are continuously subject to shocks and disturbances brought on by decisions of actors that tend to push the system away from the equilibrium, SESs can be thought of as moving about within a particular 'basin' or 'regime' (Walker et al., 2004).

Resilience is defined as "the capacity of a system to absorb disturbance, undergo change, and still retain essentially the same function, structure, and feedbacks - the same identity" (Walker & Salt, 2006, p.62). A resilient SES then has a greater capacity to avoid regime shifts from external disturbances and continue to provide the same ecosystem services to the surrounding population. (Walker & Salt, 2006). Because of the dynamic and complex nature of SESs, resilience is not in a steady state. Instead, resilience can be described and analysed as expanding and contracting over time, continually self-organising through adaptive cycles of change (Gunderson & Holling, 2002; Walker et al., 2004; Walker & Salt, 2006; 2012). The adaptive cycle proposes that systems cycle through four phases: exploitation, conversation, release, and reorganisation (see figure 1) (Holling, 2001).

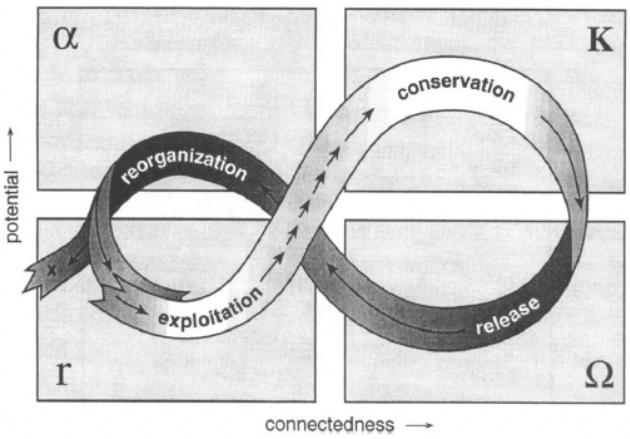

***Figure 1**. Adaptive Cycle (Holling, 2001, p.394)*

The natural sciences acknowledge that changes to the adaptation of a system's resilience is influenced by cross-scale interactions across complex adaptive systems (Gunderson & Holling, 2002; Folke et al., 2016). Adaptive cycles are thus interconnected and nested across a hierarchy of spatial and temporal scales (Holling, 2001). Gunderson & Holling (2002) describe this phenomenon as panarchy.

As illustrated in figure 2, panarchical connections allow changes to the adaptive cycle in one system to interact with other connected adaptive cycles through smaller revolt and larger remember connections, that consequently impact their functioning and resilience (Williams et al., 2021). For instance, seagrass, followed by fish species, compiled as a bay and eventually a gulf can each be described as individual adaptive cycles, scales, or systems part of a complex adaptive system (Walker & Salt, 2006). This process of analysing resilience across scales or nested systems can be described as C-SR.

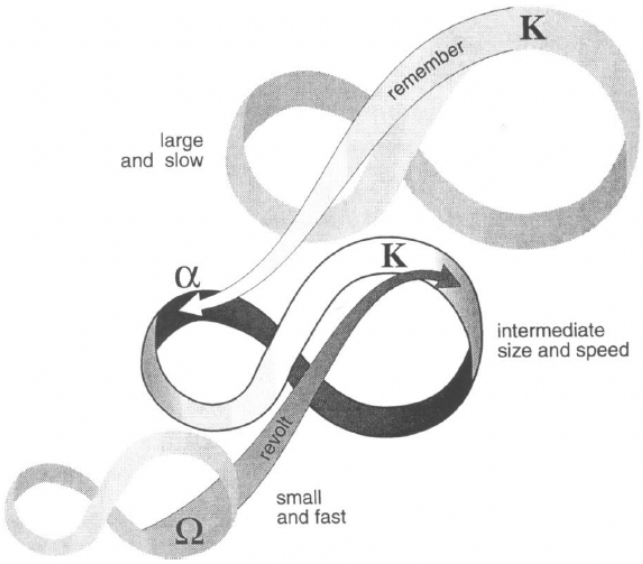

Figure 2. *Panarchical connections (Holling, 2001, p.398)*

Misuse or external forces can cause adaptive cycles to collapse due to the eradication of their potential and diversity (Gunderson & Holling, 2002). This maladaptive condition can then propagate through the successive levels of a panarchy, eventually causing an entire panarchical collapse. In the context of previous complex adaptive systems example, disruptive land use alters water levels and circulation leading to the deterioration of biodiversity in the bay, consequently leading to murky waters, plankton bloom, and fewer fish species (Walker & Salt, 2006). For this reason, an organisation (a subsystem) can be resilient, at the expense of the broader SES by overwhelming the sustaining properties (Williams et al., 2021). Tashman & Rivera's (2016) paper demonstrates how in the wake of climate change U.S. ski resort industries are adapting to ecological uncertainty using artificial snow machines that themselves cause more greenhouse gases.

The notions of SESs, resilience, and cross-scale interactions thereof have been explored by organisational scholars, which we turn to next.

2.2. Resilience thinking in organisations

In the organisational literature, scholars have primarily examined resilience in the context of a firm's responses to external threats (Clément & Rivera, 2017; 2019; Linnenluecke & Griffiths, 2010; Weick 1993), or high-reliability organisations (Weick & Sutcliffe, 2001). Here researchers have found that social and environmental practices associated with business sustainability contributes to long-term organisational resilience (Ortiz-de-Mandojana & Bansal, 2016). Moreover, firms can build resilience to social systems such as communities (McKnight & Linnenluecke, 2016). Others have shed light on the interdependence between

firms and ecosystems, as firms not only rely on ecosystem services but may also affect the supply of these services (Clément & Rivera, 2017). Literature highlights scenario planning and adaptive management practices as effective mechanisms to broaden managers' understanding of SESs as complex adaptive systems (Biggs et al., 2012). Implementing adaptive practices may support firms' resilience by providing them with a buffer zone regarding resources when ecological uncertainty increases (Tashman & Rivera, 2016).

Subsequent work by Biggs et al., (2012) established a framework identifying seven principles for enhancing the resilience of ecosystem services: "(P1) maintain diversity and redundancy, (P2) manage connectivity, (P3) manage slow variables and feedbacks, (P4) foster an understanding of SES as complex adaptive systems, (P5) encourage learning and experimentation, (P6) broaden participation, and (P7) promote polycentric governance systems" (p.422).

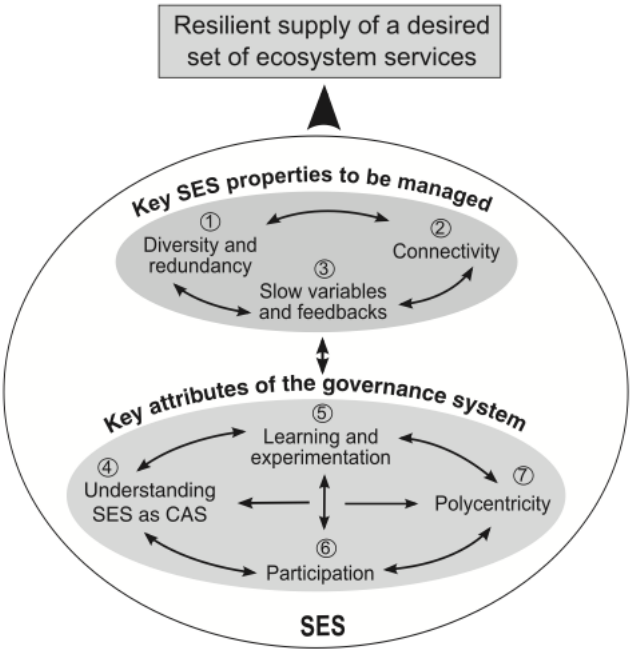

Figure 3. *Seven principles for enhancing the resilience of ecosystem services (Biggs et al., 2012, p.422)*

Biggs et al., (2012) highlight the interdependence among different principles. According to the authors, applying any one principle in isolation is unlikely to enhance the resilience of ecosystem services (Biggs et al., 2012). Moreover, they emphasise the importance of context. Enhancing the resilience of ecosystem services according to Biggs et al., (2012) depends as much on how, when, and where the individual principles are applied, and the appropriate combination thereof. As such there are no single solutions for environmental governance and its resource management problems.

Furthermore, while previous studies have integrated insights from the natural sciences and the social-ecological resilience literature, their focal scales have generally remained firm-centric, analysing the existence of organisational resilience (Hahn & Figge, 2011; Williams et al., 2021). Hence a holistic understanding of resilience across SESs remains lagging. Williams et al., (2021) underline that without the consideration of cross-scale dynamics, managers may not fully understand the impacts of their firms' actions on interconnected systems. This may lead to firms improving the resilience of sub-systems while remaining oblivious of the unforeseen

consequences on the total system the firm is embedded within (Williams et al., 2021). As such, firms' well-intentioned sustainable activities may still contribute to the deterioration of critical ecosystem thresholds, and thereby threaten the organisations' long-term survival (Williams et al., 2021).

In recent years only a branch of studies has investigated beyond organisational resilience to examine mechanisms that may help to manage for C-SR (Dentoni et al., 2021; Linnenluecke, 2015; A. Williams et al., 2017; T. A. Williams et al., 2017; Williams et al., 2021;). Dentoni, Pinkse, & Lubberink (2021) find that socially organised subsystems, such as cross-sector partnerships facilitate organisations to better respond and adapt to exogenous and endogenous threats to resilience. They argue that partnerships can foster deeper dialogues amongst different system members, and have them question and redefine their own organisations' goals, activities, and strategic intent (Dentoni et al., 2021). Moreover, they highlight the learning elements that cross-sector partnerships can offer a firm. By engaging in many small-scale experiments, Dentoni et al., (2021) reason that organisations purposely challenge the dominant logic and hence can more quickly recognise issues that could threaten the SES (Martí, 2018; Orr & Donovan, 2018). Likewise, in the context of disaster responses, Williams & Shepherd (2016) find that transforming local ventures which activated relationship ties, facilitated resource mobilization that later helped victims become self-reliant and autonomous.

Finally, Williams et al., (2021) propose a systemic framework for managing C-SR. According to the framework, social-ecological resilience can be enhanced by shifting a focal scale bias, as well as through the identification and monitoring of slow variables, functional redundancy, and response diversity across nested SESs (see table 1) (Williams et al., 2021).

Category	**Managerial approaches leading to a decline in C-SR.**	**Managerial approaches that enhance C-SR.**
Focal Scale Bias & Complex Adaptive Systems View	"When managerial approaches suffer from a focal scale bias (and narrowly interpret resilience as an organizational variable), important cues from other spatial scales are overlooked" (p.12)	"Managerial approaches that interpret social-ecological issues based on properties of complex adaptive systems (multiscale, nested feedback)" (p.12)
Feedback & Slow-Moving Variables	"When managerial approaches do not identify slow variables and monitor their changes with respect to threshold limits, important ecological cues are overlooked" (p.15)	"Managerial approaches that identify and monitor slow variables across ecosystems in which they operate" (p.15)
Diversity & Redundancy	"When managerial approaches do not monitor functional redundancy and response diversity of ecosystems in which they operate, important cues on cross-scale resilience may be overlooked" (p.17)	Managerial approaches that maintain functional redundancy and response diversity of ecosystems in which they operate" (p.18)

Table 1. *Cross-scale resilience systemic framework (Williams et al., 2021, p.10-21)*

In the field of organisational resilience, the notion of C-SR is nascent and peripheral at best. Given this complexity, IR is a potential mechanism for organisations to manage for C-SR.

2.3. Integrated reporting

The International Integrated Reporting Council (IIRC) first published the International Framework for Integrated Reporting IR in 2013 (IIRC, 2021). Coined by literature as the "new reporting paradigm" (Simnett & Huggins, 2015, p.1) an IR is defined as "a concise communication about how an organisation's strategy, governance, performance, and prospects, in the context of its external environment, lead to the creation, preservation or erosion of value in the short, medium and long term" (IIRC, 2021, p.10). Integrated reporting combines both financial and non-financial (environmental, social, and governance) disclosures of a company's performance in one report. A set of fundamental concepts and guiding principles "reinforce the requirements and guidance" in the IR framework (IIRC, 2021, p.15) (see Appendix A & B). Moreover, businesses measure and report on the six capitals the IIRC suggests their operations depend upon to create value: "financial, manufactured, intellectual, human, social and relationship, and natural" (IIRC, 2021, p.18) (see Appendix C).

A decade after its establishment, the IR framework has been adopted by more than 2,500 companies in over 70 countries (IIRC, 2020). Furthermore, in 2022, the IR framework was officially consolidated into the International Financial Reporting Standards (IFRS) Foundation - which is already the mandatory reporting standard in 167 countries - thus strengthening why IR is useful to study (IFRS, 2022; IFRS, 2022, August). However, to this day IR remains voluntary and does not require specific key metrics, or measurement methods, which in the past has led to a multitude of different IR practices (Perego et al., 2016).

The process of an IR is founded on integrated thinking, which is defined as "the active consideration by an organisation of the relationships between its various operating and functional units and the capitals that the organization uses or affects" (IR, 2021, p.3). Hence, IR has the potential to shift the perspective of corporate actors to a more comprehensive understanding of an organisation's value creation story (Eccles & Krzus, 2010).

Literature finds IR to fulfil two primary objectives, namely, an 'information' and 'transformation' function which enables "investors to make capital allocation decisions" and companies to get input on "resource allocation decisions" through stakeholder engagement, respectively (Eccles, Ioannou & Serafeim, 2014, p.18-19; Perego, Kennedy, & Whiteman, 2016). Thus, the framework can be used as a management mechanism (IR, 2021).

2.4. Integrated reporting as a mechanism for management

The majority of existing literature evaluates the antecedents and consequences associated with IR and offers paradoxical insights into IR's organisational impact (Perego et al., 2016). For instance, Simnett & Huggins (2015) allude to several internal benefits corporations have the potential to gain from the IR journey. IR may allow managers to attain a better understanding of how the organisations value-creation is related to their strategic objectives, and vice versa (Simnett & Huggins, 2015). Moreover, IR can offer information that is more accurate, thorough, and timely (Simnett & Huggins, 2015). Steyn (2014) finds IR helped employees to increase their long-term orientation and thus mitigates short-termism. In terms of economic security associated with IR, Barth, Chan, Chen & Venter, (2017) find a positive relationship between IR quality, firm value, and expected future cash flows. This is because higher IR quality was found to improve internal decision-making and investment efficiency (Barth et al., 2017).

Nevertheless, an emerging stream of literature diminishes the capabilities of IR. Stubbs & Higgins (2014) uncovered that IR only resulted in minor changes to organisational processes and structures that were previously linked to sustainability reporting. Similarly, Higgins et al., (2019) find no evidence that IR influenced management systems, nor that senior management was involved with sustainability reporting. Additionally, authors describe how contrary to being a management process, IR is overly prioritized by firms as a toolset for communication (Perego et al., 2016). In an empirical study by Vesty, Ren, & Ji (2018) the chairman of an integrated reporting pilot organisation expressed his concerns about the framework's six capitals being "rather restrictive" (p.1421), and insufficiently aligning with what they do or how they created values.

In summary, literature has yet to find a consensus on IR's value as a mechanism for management. How IR might be used to manage for resilience is discussed further in the following section.

2.5. Integrated reporting to help manage for resilience

Studies looking at how IR can be used to help manage for resilience remain limited. On the one hand, some scholars criticise that IR cannot account for sustainability performance (Brown and Dillard, 2014; Flower, 2015; Gray, 2002, 2010; Perego et al., 2016; Thomson, 2015). Flower (2015) critiques the IR framework for falling considerably short of its original objectives as the IIRC's reluctance to place reporting requirements on the firm's management enables firms to justify damaging the environment. Moreover, Flower's (2015) analysis highlights the IIRC's assumption that there is no inherent tension between the firm's and society's interests. Accordingly, he claims firms do not fully disclose how their activities affect "stakeholders, society and the environment" (Flower, 2015, p.8). Thomson (2015) attributes this problem to the IR framework being deeply rooted in the "business case, investor dominance, and capitalism" (p.2), rather than sustainability. Using integrated reporting according to Thomson (2015), "reduces sustainability into [six] sources of corporate value" (p.2) that focuses on increasing the wealth of investors. The amalgamation Flower (2015) argues is evident that the framework does not account for sustainability.

In this respect, the IR framework insufficiently focuses on system-level sustainability and inadequately supports management to thoroughly link the dynamics between their organisation and the natural environment (Thomson, 2015). Other critics offer a more radical point of view and argue that accounting practices that report on an entity's ESG activities hinder fields essential for any sustainable development (Gray, 2010; Gray 2006; Milne & Gray, 2012; Henriques & Richardson, 2004). Decisively, this raises issues about the reliability and validity of the IR framework to help manage for resilience.

On the other hand, advocates find that IR can broaden organisations' understanding of SESs in which they are embedded. Williams (2018) advocates that IR can help companies understand their value-creation to identify matters that are material in the short, medium, and long term. Moreover, Churet and Eccles (2014) report a strong relationship between IR and environmental, social, and governance quality of management which they contend reflects the long-term effectiveness of management generally. In this way, IR may encourage a greater understanding of corporate involvement in sustainability across several areas (Stacchezzini, Melloni & Lai, 2016).

Furthermore, by putting both financial and Corporate Social Responsibility (CSR) performance into one report, Eccles and Krzus (2010) express how an IR promotes all stakeholders to adopt a more "holistic perspective" (p.152). Integrated reporting ensures the coherency and consistency of the information that goes out to all stakeholders (Eccles and Krzus, 2010). This they deem achieves a "platform for one conversation" and more meaningful engagement amongst these parties (p.152). Therefore, increased stakeholder dialogue can aid in defining expectations and improve understanding between parties (Steyn, 2014) which in turn can prompt cross-sector partnerships to find innovative solutions (Dentoni et al., 2021). In this way, the IR framework may broaden participation and foster complex adaptive systems thinking amongst decision-makers.

In the field of IR, relatively little research has addressed the notion of managing for resilience. IR postulates that it should at least provide some help. The significance for research on how IR can be utilized to manage for social-ecological resilience is emphasized by academics (Williams, 2018; Williams et al., 2017). Yet, existing works remain conceptual and lack empirical studies applying such a cross-scale perspective.

3. Methodology

3.1. Research methods & research design

The purpose of this thesis is to investigate how IR supports managerial approaches that foster C-SR. To this date, IR literature has largely ignored resilience, or remained theoretical in nature, therefore leaving it very open for an exploratory study. Qualitative researchers investigate subjects in their natural environments (Denzin & Lincoln, 2011; Creswell, 2013). Therefore, a **qualitative** research design utilizing an **inductive** view seems to be worthwhile to draw patterns from the observations (Bell, Bryman, & Harley, 2019). Coinciding, a **grounded theory** method was adopted to allow for the construction of theoretical concepts (Charmaz, 2006). The objective of a grounded approach consists of collecting and analysing data to construct theories that are 'grounded' in the data themselves (Charmaz, 2006). Hence, grounded theory is most applicable since it allowed the researcher to discover the lived experiences of how managers use IR to navigate for resilience. To ensure the possibility of replication, the following data collection and analysis sections extensively cover the research process.

3.2. Data collection

The Netherlands has a strong history of leading best practices for corporate reporting, with the IIRC considering Dutch companies as IR frontrunners (The International Integrated Reporting Council (IIRC), 2020; The Value Reporting Foundation (VRF), 2015). Hence, it is believed there is a likelihood of observing organisations that have accumulated experience using IR for C-SR. Consequently, this study focuses on companies based in the Netherlands exclusively.

For primary data, semi-structured in-depth interviews were conducted with IR and sustainability managers working in the selected organisations implementing IR. Additional interviews were held with consultants working with the IR framework as they provide pluri-disciplinary knowledge on the process of integrated reporting. The final sample count contains 13 interviews. The interviews varied in length from 25 to 40 minutes, averaging at 30 minutes, and amounting to a total of 415 minutes (see table 1 below). Additionally, sector diversity was taken into account, totalling 7 unique industries.

#	Identification	Function	Sector	Pseudonym	Date	Record time
1	IR & Sustainability manager - Bank & Insurance 1	IR & Sustainability manager	Bank & Insurance	P1	29/04	30 min
2	Sustainability manager – Transportation 1	Sustainability manager	Transportation	P2	17/05	30 min
3	IR manager – Bank & Insurance 1	IR manager	Bank & Insurance	P3	18/05	40 min
4	IR & CSR manager - Energy, Oil & Gas 1	IR & CSR manager	Energy, Oil & Gas	P4	24/05	35 min
5	IR manager – Bank & Insurance 2	IR manager	Bank & Insurance	P5	30/05	40 min
6	IR manager – Transportation 1	IR manager	Transportation	P6	02/06	40 min

7	IR & Sustainability manager – Industrial Goods 1	IR & Sustainability manager	Industrial Goods	P7	08/06	35 min
8	CSR manager – Technology 1	CSR manager	Technology	P8	09/06	25 min
9	IR manager – Bank & Insurance 3	IR manager	Bank & Insurance	P9	17/06	30 min
10	IR & Sustainability manager – Bank & Insurance 2	IR & Sustainability manager	Bank & Insurance	P10	17/06	40 min
11	Sustainability manager – Construction & Maritime 1	Sustainability manager	Construction & Maritime	P11	20/06	E-mail
12	Consultant – Services 1	Consultant	Services	P12	22/06	30 min
13	IR manager – Industrial Goods 1	IR manager	Industrial Goods	P13	24/06	40 min

Table 2. *Table of interviews*

Literature calls upon the use of perceived front-runners in IR to be most valuable to delineate success factors (Perego, Kennedy, & Whiteman, 2016). The Transparency Benchmark is a bi-annual study carried out by the Dutch Ministry of Economic Affairs and Climate Policy that measures and ranks the largest companies in the Netherlands based on their transparency in reporting on CSR policies and activities (Ministry of Economic Affairs and Climate Policy, 2022a). Hence, the 2021 edition of the Transparency Benchmark (Ministry of Economic Affairs and Climate Policy, 2022b) was incorporated as a criterion when determining the population sample. Starting with the highest score and going down the ranking, companies were selected when clearly stating the use of the IIRC framework in their integrated annual reports. From the Transparency Benchmark company overview scores 2021, the majority of participants in this research were positioned within the top 20 scores.

Purposive non-probability sampling was applied by selecting participants who hold organisational positions that manage sustainability and IR in the company. Additional theoretical sampling allowed to elaborate and refine the categories constituting the theory (Charmaz, 2006). Interviewees were found and contacted either through the company email or via LinkedIn. The interviews were conducted in English or Dutch, depending on the preferred language of the interviewee. Due to Covid-19 measures in the given time frame one-to-one interviews were held online via Zoom or Teams.

The purpose of the interviews was to learn more about managers' experience and observation of IR within the duty of their work. Kvale (1996) recommends that interviews should be organised in seven stages: thematising, designing, interview, transcribing, analysing, verifying, and reporting. Likewise, interviews were prepared and conducted based on a script in the form of an interview guide (see Appendix D). While a predetermined set of questions was formulated, the guide was improved upon throughout the series of interviews. Moreover, the interviewer's judgment was used for follow-up questions, meaning questions and their sequencing sometimes varied.

Secondary data was supplemented in the form of examining publicly disclosed annual integrated reports for all interviewed companies for the years 2020 and 2021. Chapters relating to non-financial and sustainability data were analysed, taking special note of those sections relating to the application of the IR framework.

3.3. Data analysis

In grounded theory data collection and analysis can be described as a "zigzag" process occurring iteratively (Creswell, 2013, p.86). Hence conducting the interviews and analysing the data were done simultaneously. This constant comparative method of data analysis followed a three-step process moving from raw data to theoretical interpretation, combining the methods derived from Charmaz (2014) & Gioia et al., (2013). Starting with 1st order coding, followed by 2nd order coding, and concluding with aggregate dimensions (Gioia et al., 2013). Only the interview transcripts were coded conforming to these phases using coding software Atlas.ti.

In the first step of coding, the researcher stuck close to the data remaining open to all theoretical possibilities (Charmaz, 2014). Applying line-by-line examination followed an iterative process of labelling the gathered data into as many categories as possible. Coding with 'gerunds' helped to detect processes and preserve action when possible (Charmaz, 2006). For example, "understanding organisation value-creation" or "communicating with stakeholders" or "disciplining the organisation." Complementary 'in-vivo' codes were used to preserve the participants' true meanings (Charmaz, 2006). For example, "awareness of SES trends" or "explanation of IR process." A total of 38 codes were generated from the 1st order concepts. Two examples of merged codes included "IR as a tool for external accountability" and "annually reflecting on the organisation." Next, through the process of constant comparison, connections were sought between emerging themes and concepts. In this phase, the existing theory was incorporated to make relations between subsequent categories and subcategories visible before leading to theoretical saturation. Memo writing was used throughout to capture initial comparisons and connections, and crystalise questions and directions (Charmaz, 2006). For example, the analysis revealed that the previous concept, "understanding organisation value-creation" could be grouped with "knowledge of materiality" and "insight into the organisations' impacts" etc., to form the theme "impact awareness." 10 categories were determined as 2nd order themes.

Finally, abstract theoretical categories were aggregated from the 2nd order themes to form the theory to answer the research question. The final 4 aggregate dimensions formulated the foundation for a coherent analytic story. For example, the category "impact awareness" together with "position mapping" and "organisation discipline" each highlighted ways in which IR supported managers understanding of the impacts between the organisation and the external environment. Successively, they were combined to form an aggregate dimension known as "double materiality awareness" (see Appendix E).

3.4. Research quality

To establish the rigour and quality of this research, validity, reliability, transferability, and ethical principles were considered while performing this research.

To ensure validity, efforts were made to limit interviewees' bias by considering linguistic forms of questions and using main types of questions (i.e., introductory, follow-up, probing, or

direct/indirect) (Kvale, 2007). Additionally, Kvale (2007) highlights how consistent use of one type of questioning throughout an interview may lead to a specific style of the answers and eventually the kind of knowledge produced. Therefore, predetermined open-ended questions were asked with the emphasis to encourage the interviewee to describe. Furthermore, considering the qualitative nature of this thesis, it is important to limit the researchers' bias. Thus, data was constantly revised, and many data incidents were used to form codes to ensure credibility and data triangulation (Bryman, 2015). Besides combining semi-structured interviewing with secondary data analysis, data was compiled from various sources including, interviews with sustainability managers, IR managers, consultants, and annual integrated reports.

Turning to the reliability, the possibility to replicate the study was upheld by adopting mainstream qualitative research methods as well as by constant comparison of data, and the use of transcripts to record data. Additionally, transferability refers to external reliability and is concerned with whether the findings hold in other contexts, settings, or timeframe (Bell et al., 2019; Lincoln & Guba, 1985). Here a 'thick description' of the research methodologies and details that ensued the data collection and analysis process were provided (Bell et al., 2019; Geertz, 1973). This enables the reader to make a transferability judgment.

Finally, ethical principles were reviewed. Diener and Crandall's (1978) four main areas stress the need to; (a) minimize the risk of harm to participants; (b) obtain informed consent from potential research participants; (c) protect anonymity and confidentiality; (d) avoid using deceptive practices (Bell et al., 2019). Likewise, ethical issues throughout the interview inquiry were considered. All participants were adequately informed beforehand of confidentiality, protection, and anonymisation of their personal information and responses provided. This is also with the intention in mind to put interviewees at ease during the process so that they may talk about their points of view and experiences more freely to an outsider.

4. Findings

This chapter presents the findings comprising the collected and analysed interviews as well as the firms' integrated annual reports. The emerging themes from the content analysis are highlighted in the context of IR as a mechanism for managing C-SR. Each aggregate dimension closes with a summary detailing how these findings relate to C-SR. The findings are brought together at the end. From the data following aggregate became apparent: (1) double materiality awareness; (2) external accountability; (3) connectivity of functional departments; (4) integrated decision-making. A summary of the final coding structure can be found in figure 4 below.

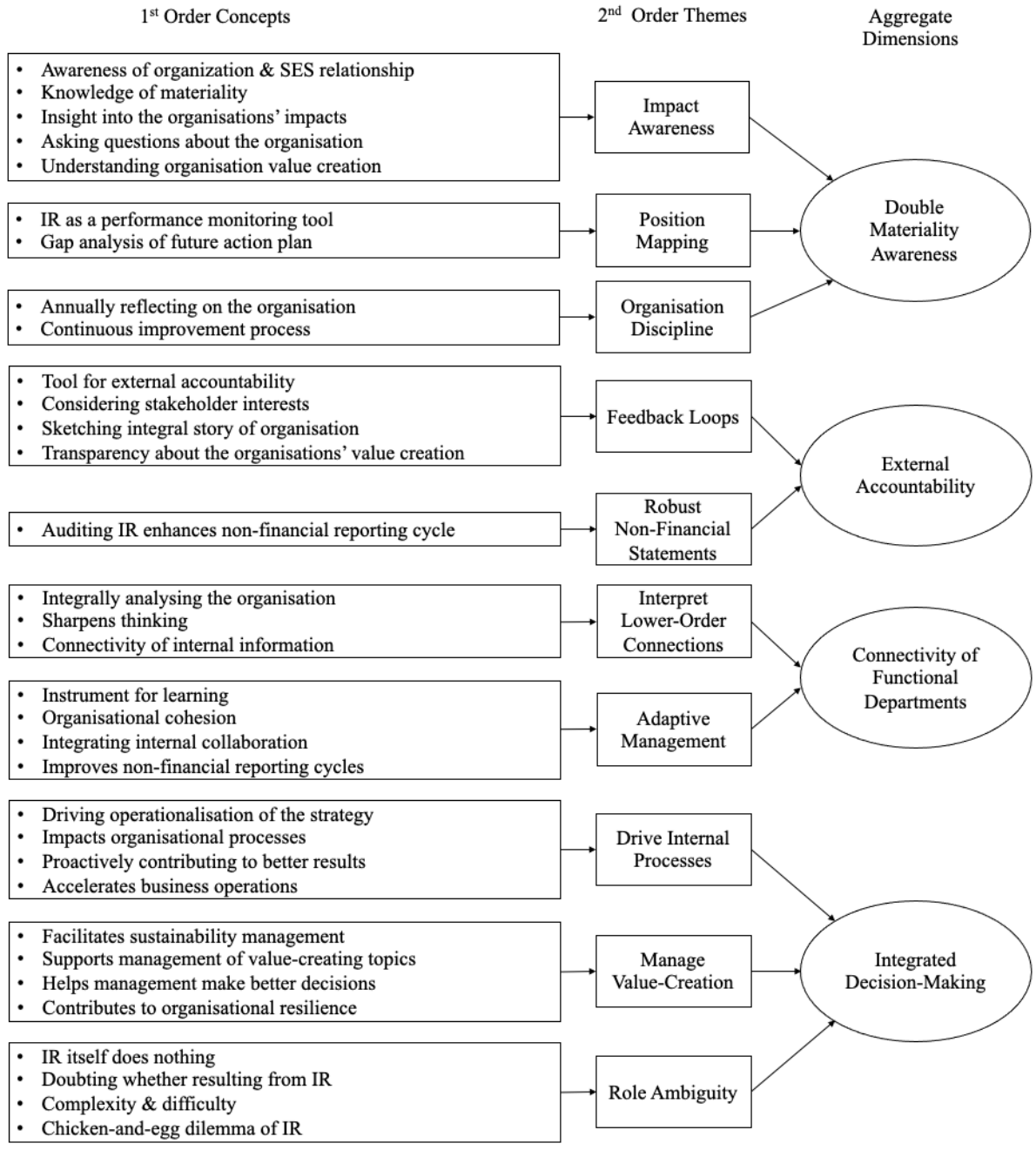

Figure 4. *Coding structure*

4.1. Double materiality awareness

The findings from the first aggregate dimension suggest that IR supports managers' understanding of the impacts between the organisation and the external environment. It consists of (a) impact awareness; (b) position mapping; (c) organisation discipline.

4.1.1.Impact awareness

Interviewees stated that IR made them more aware of the interrelationship between the organisation and the broader SES. For example, interviewee 1 explained: *"the entire process means that you have to think carefully about where you fit as an organisation within the natural environment, and what impact you have"* (P1). Secondary to this, several respondents referred to the IR giving them a summary of their organisation's external impacts. Participant 2 highlighted: *"we now just know where our major impact is, both positive and negative. We also know because you do integrated reporting […] what the world thinks is important, where you can make a difference as a company"* (P2).

Besides a close examination of developing themes taking place around the organisation, the IR also supported managers' awareness of how events could influence the business model. Manager 4 evaluated: *"what you now see in the last 2-3 years is that we have also started to look the other way, what do all those developments that take place around us, e.g., due to climate change, what do they mean for us as a company, and on the company's operations"* (P4). Moreover, managers repeatedly indicated that the IR often raises complex questions. For example, as manager 1 highlighted: *"How does it work again? What value have we created? What impact have we made? What is our strategy? How do we think that went? Who are the stakeholders?"* (P1). In this way, IR makes managers more mindful of potential concerns that are material to the organisation's value-creating ability.

Managers find that IR helps them have a better view of the organisations' value creation beyond just the financial dimension. Manager 13 talked about the IR: *"it allows you to kind of compare and contrast the value derived to society across multiple dimensions"* (P13). This implies that IR can drive managers' awareness of how the organisation is connected and interacts with variables in the SES.

Furthermore, the findings revealed that IR may support managers to better understand remember connections (larger & slower). Climate change was found to represent an example of such a slower-moving cycle, which was identified by all managers. Additionally, managers noted global warming, biodiversity loss, paying a living wage, and tightening local labour markets as other long-term material variables. Conversely, interviewees revealed that the revolt connections (smaller & faster) of COVID-19 spread through the successive levels of panarchy at a rate faster than could be absorbed or embedded by IR. Subsequently, the organisations did not make use of their IR to employ pre-emptive measures to absorb the disturbances of COVID-19 on the organisation. Participant 3 explained: *"I don't think anyone could have seen the pandemic coming. In any case, we had not included it in our risk analysis. I do think there is more and more attention for it."* (P3). In this way, a pace of change seems to be highlighted across interviews, suggesting that IR is an appropriate mechanism to keep track of slow variables, however weaker for fast variables. Additionally, as changes are included in their risk analyses over time, IR may provide managers with the opportunity to become more nuanced at anticipating different external developments.

4.1.2.Position mapping

Furthermore, most interviewees mentioned that the IR serves to monitor performance, accounting for the policy they have pursued, and the results conducted in the past year. Interviewee 12 explained: *"I see integrated reporting as kind of a gap analysis of your company's action plans for the future"* (P12). In this way, the IR keeps managers current on the organisations' position and progress towards different financial and non-financial targets. IR, therefore, facilitates an organisation's situational awareness.

However, participants did indicate that the IR is generally based on data that is a year old or longer, which is not good enough to steer on. To compensate for this delay, a few interviewees explained that they include several sustainability criteria in other interim internal reports and dashboards to remain up to date. Manager 7 for example emphasised: *"I manage it based on data that is sometimes a year old or longer […] and you can't steer on data that old. […] Because if I don't find out until the end of the year that I haven't met my goals, then it's a little late, then we can't take any more corrective actions"* (P7). Therefore, an IR does not seem to be timely enough to assist managers with forward-looking information within a management cycle.

4.1.3.Organisation discipline

Complementary to this, having to return to and going through the process of IR every year makes managers think and reflect more about what they want to report on, why, and how. The annual exercise repetitively brings to the surface the organisations' inputs, resources, and (negative and positive) value-creating outputs. Manager 8 explained: *"in the process, it has shaped our thoughts about how we have the company put together, and how certain topics might be more firmly embedded in the strategy"* (P8).

Running parallel, managers emphasised that they continuously want to see improvements in their KPIs to achieve the long-term formal objective of the firm. The management cycle of the IR framework was considered by some managers to have a disciplining effect on the organisation. According to the experience of interviewee 9: *"So that brings the discipline that if you're doing something you can demonstrate it and you can monitor it. And that's what I think the reporting has created, that discipline between the story you tell, you need to be able to demonstrate it in numbers and it needs to be traced"* (P9). This mandatory nature of reporting can endorse organisations to practice what they preach. Additionally, the IR framework requires managers to be a lot more granular about disclosing their non-financial data. This can have a knock-on effect throughout the organisation in terms of improving the process of reporting.

Overall, IR keeps managers on their toes of the organisations' value-creating outputs and allows them to make better decisions to adapt to shocks and disturbances that may adversely affect the SES and consequently the organisation. Interviewee 12 detailed: *"if you have this value creation model, you're aware, what the company brings, and what effect you, as a company, have on the society and the environment"* (P12). Secondly, supported by manager 6: *"This also leads to some awareness, that it is important to understand which ecosystem we are in, and what influences our business operations. And which events can have an impact on the way we do business"* (P6). Additionally, by keeping track of the organisation's progression, the IR can support managers to increase their long-term orientation.

Nevertheless, the data suggests that managers predominantly concern themselves with disturbances and changes that are material to the organisation's own ability to create value. Interviewee's 1 explained: *"The order should be that in your integrated annual report you explain how you have created value, or how you think you will create value, what the material or value-creating topics are, and how you have incorporated these into the strategy"* (P1). Moreover, sustainability seems to be interpreted as a matter of risks and opportunities. If this is the case, IR remains focused on organisational resilience and does not necessarily inform managers concerning systems threshold limits that may lead to an eventual regime shift. Manager 13 spoke about one of the purposes of an IR: *"to inform our investors that we have a long-term approach or understanding about what the risks are facing our business as a result of climate change, negation or adaptation. And to demonstrate resilience about our business model toward those items, so that we are seeing from a financial perspective as a good, long-term financial investment"* (P13). Perhaps IR can unintendedly support managers to gain an awareness of the complex interactions and dynamics that exist between organisations and ecosystems in a SES. However, it does not seem to do so purposefully.

Therefore, the findings suggest that IR does not directly stimulate complex adaptive systems thinking nor help to manage for slow variables. Still, IR does crystalise responses from the operating environment on the firms' actions. Therefore, the findings support IR helps to manage feedback effects.

4.2. External accountability

Turning to the second aggregate dimension, the findings highlighted how the IR stimulated a process to receive feedback from external stakeholders, which in turn broadens participation and anchors managers' accountability of non-financial information. Comprising of (a) feedback loops; (b) robust non-financial statements.

4.2.1.Feedback loops

Almost all interviewees highlighted that the primary purpose of an IR is at least to explain to stakeholders as transparently as possible how the organisation creates value. In this way, managers use an IR as a tool to communicate with key stakeholders i.e., customers, investors, social organisations, and other interested parties.

Interviewee 6 talked about the IR: *"it is also the document in which we tell the complete integrated story of the organisation."* (P6). Besides using the IR as a business record to satisfy the information needs of stakeholders, interviewees also highlighted the importance of stakeholder engagement to provide insight into themes that are considered most important for them. Additionally, it can shed light on trends that have not yet come to the managers' attention, but which are increasingly significant and material for the organisation. In this sense, stakeholder feedback on IR can make managers aware of how the SES is changing. Likewise, manager 2 gave an example of how they were prompted to engage in a new partnership with one of their stakeholders: *"we are really going to work together with the energy suppliers so that new green electricity is generated for us so that we really add. That's one of those things that comes from being aware of the environment, the climate"* (P2).

Secondary to publishing an annual IR, interviewees explained that it also allows stakeholders to provide feedback on the direction of the company. In that way, IR acts as a process through which feedback can be obtained while also functioning as a mechanism for external

accountability of managers' actions. For example, Manager 9 described: *"The report is material for your stakeholders to come to you and say, "by the way, I don't think you're doing right here" or to tell you, "I think you're doing very well here" so, the report is a tool also for accountability, for external stakeholders to ask"* (P9). When external stakeholders provide feedback on the IR, the findings supported that this could influence strategic decision-making. Hence, the exercise of generating annual IRs helps to earn more trust from stakeholders over time.

4.2.2.Robust non-financial statements

Managers spoke of the influence of auditing on the IR, which although not mandatory, pushes their organisation to have their non-financial reporting cycles as robust as their financial ones. Interviewee 13 affirmed: "*if you have assurance on your non-financial statements if you have it to the same level as your financial statements, it also has that knock-on effect throughout your organisation that you also need to step up in terms of how do you collect your environment or social data that you can show that you have the internal control framework in place and […] the reporting methodologies robust enough to basically, stand up to the same level of scrutiny as your financial"* (P13).

To summarise, the data shows that IR is a catalyst for ongoing stakeholder engagement through which meaningful and diverse knowledge is shared. Moreover, because an IR enhances transparency and accountability, managers are increasingly responsible for their non-financial objectives, which in turn can contribute to managing for C-SR. Auditing was found to be an additional voluntary force that can bring the level of scrutiny of IR up by a notch. Therefore, it further consolidates the accountability of managers in the process. Finally, IR seems to broaden participation through active engagement with relevant stakeholders which is fundamental to fostering social-ecological resilience.

4.3. Connectivity of functional departments

Thirdly, the findings highlighted IR supports connectivity of information which can promote organisations' adaptive capacity to manage for C-SR. (A) interpret lower-order connections; (b) adaptive management formulate this aggregate dimension.

4.3.1.Interpret lower-order connections

On numerous occasions, managers talked about how IR helped to embed integrated thinking into the organisational structure. While some managers referred to it as the most important value derived from IR, others described it indirectly through their management approach. Manager 8 talked about IR: *"The report did help to some extent to also look at the business operations in an integrated manner"* (P8). Nevertheless, as underlined by interviewees, incorporating the IR findings in the business operations and management approaches is strongly supported by integrated thinking. Manager 1 stressed: *"The concept of integrated thinking is crucial in reaching better decisions and improving a business. Companies can learn from gaps or challenges found during the reporting process and by applying an integrated thinking approach they can use these findings to improve. For example, by ensuring that findings around preparing for an integrated report, that you actually do something with it"* (P1). Hence, integrated thinking can catalyse greater connectivity of information flow throughout the organisation and help managers understand the interdependencies between lower-order department levels.

However, managers using an IR are focused on managing organisational connectivity, and not necessarily on identifying the relevant parts, scales, and interactions of the ecosystem services their organisations depend upon for long-term survival.

4.3.2.Adaptive management

Managers also spoke of the IR as an instrument of learning. The structure of the IR, in terms of setting objectives, reporting on policy, and progression provides an agenda for discussion with internal stakeholders in the company. Overall, interviewees have seen greater cooperation across levels of operation thanks to this annual task. Interviewee 6 talked about the changes he observed: *"I wouldn't say so much that the IR itself made us do things differently. […] The integration not only from management, strategy, or finance, but also really collaboration at all levels within the operation. […] in terms of the vision that we have to manage more integrally, this has led to an acceleration in our environmental domain"* (P6). Interviews supported IR to improve their ability to deal with changes and surprises that occur in the market. Thus, similarly, IR may strengthen the organisations' adaptive capacity to manage for C-SR.

Therefore, these findings suggest that IR encourages learning and internal collaboration as a central part of decision-making. Because SESs are in constant flux, continuous learning and experimentation can improve problem-solving and enable adaptation to management approaches, which are prerequisites to enhance the resilience of SESs. Moreover, cohesive governance structures support management's agility to deal with and recover from disturbances in systems more swiftly. Thus, IR can be a mechanism for adaptive management by building diversity and redundancy into governance systems.

4.4. Integrated decision-making

The final aggregate dimension that emerged from the findings revealed how IR drives the operationalisation of the organisation's value-creation. However, managers expressed doubts about the extent to which impacts can be attributed to IR alone. It includes (a) drive internal processes; (b) manage value creation; (c) role ambiguity.

4.4.1.Drive internal processes

Participants highlighted that embedding IR in the organisation drives operationalisation of strategy in the management approach which can subsequently lead to better processes internally. Manager 2 talked about this development: *"first it's actually collecting, but because you collect you can then also begin to bend to, okay but if we do a little more on a subject, then you can also grow on that and then you consciously proactively contribute to better results"* (P2). The findings imply that IR induces integrated decision-making which can accelerate operational performances. Thus, when sustainability or resilience-thinking, etc., become ways in which the organisation creates value, IR can have an important function to embed them with organisational objectives.

4.4.2.Manage value creation

More specifically the data showed that IR supports the management of organisations' value-creating topics. Participant 3 supported this opinion: *"I do think it has helped, as soon as you make it measurable and insightful, of course, that ultimately also has an impact on how you manage sustainability in the organisation"* (P3). Still, only two interviews explicitly pointed

out that IR contributed to their organisational resilience. According to managers, this was rather attributed to the whole IR trajectory. Manager 1 observed: *"if you do that in a structured way, and incorporate it in your business operations, in your management approach, it will certainly deliver value"* (P1). Hence, the above-mentioned findings build sufficient evidence to support that IR can facilitate sustainability management in the organisation.

4.4.3.Role ambiguity

Finally, almost all managers casted some level of doubt surrounding the direct impact of IR. Firstly, managers highlighted that IR, and the concepts of materiality are quite complex to grasp. Furthermore, one manager warned about the definition of IR, as participant 12 explained in her experience companies confuse IR with *"combined reporting"* (P12). Moreover, other critics hesitated whether certain impacts were due to IR alone, especially with regards to organisational resilience. On four occasions managers found it difficult to confirm the correlation between IR and resilience. Participant 6 highlighted: *"I find it very difficult to give an example that the IR has ensured that we as an organisation have now become more resilient. I don't really believe it that much to be honest"* (P6). Else, managers were unsure if certain sustainability issues would not have surfaced without the IR. Generally, managers found it difficult to draw causality between the process of IR and the alluded benefits as explained in previous sections. As voiced by Interviewee 2: *"I don't necessarily know whether this is due to integrated reporting, or whether integrated reporting is more of a form to express it again. So, it's kind of a cause-and-effect story, the chicken-and-egg dilemma"* (P2). Interviews stressed that other sustainability reporting frameworks (i.e., TCFD, GRI), benchmarks (i.e., Dow Jones Sustainability Index), and non-financial reporting policies are increasingly legitimising the disclosure of information regarding how organisations manage socio-environmental challenges. Finally, one interviewee expressed that going through the IR process bureaucratically is unlikely to generate any significant positive outcomes. Manager 13 noted: *"if you just copy-paste the information because last year you published on the same then it will not work"* (P13).

Hence, these findings appear like a warning against over-accrediting accomplishments of the IR framework. For many of the interviewed managers, the causality of IR remains unclear. Moreover, the findings also highlight the plurality of ways managers can approach the IR exercise, which consequently can have drastically varying outcomes for organisations. This range seems to be partially attributed to the intention that managers put in the IR. Therefore, IR is one of numerous channels that can support managers to navigate for C-SR.

4.5. Summary of findings

This section brings the findings together which form the basis of the model as summarised in figure 5 below.

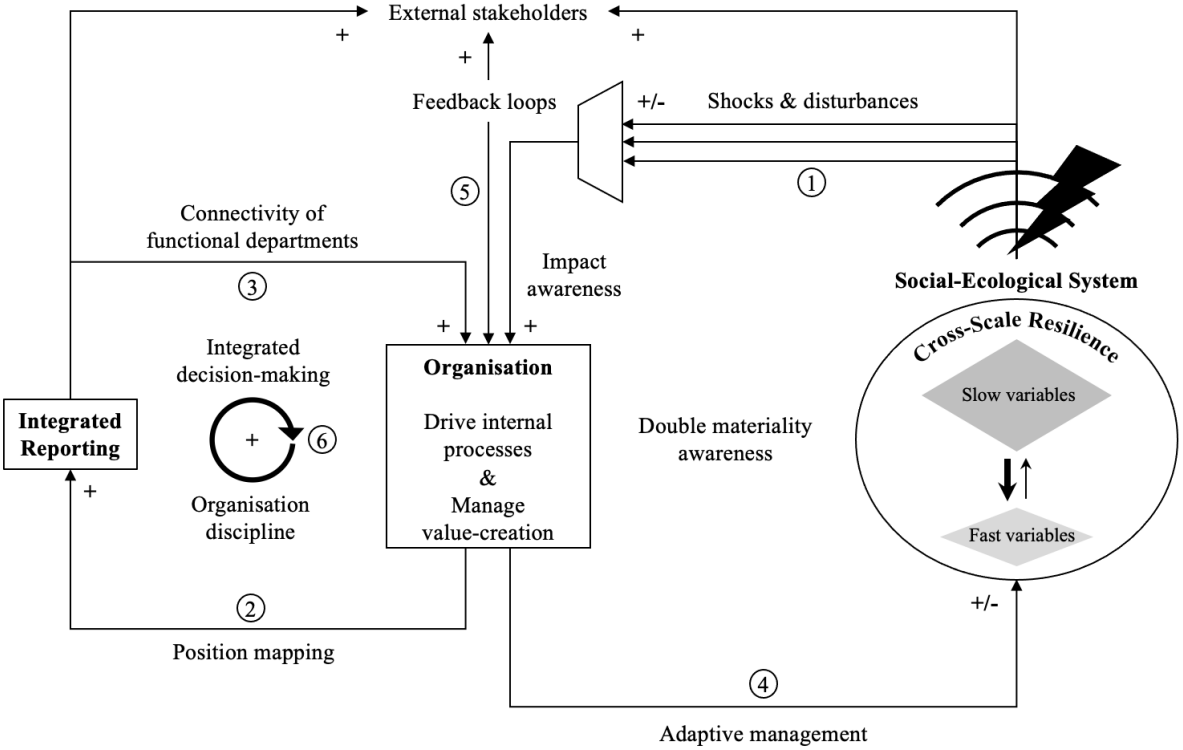

Figure 5. *A grounded model of IR as a mechanism to navigate for C-SR*

First, IR supports managers' understanding of shocks and disturbances emergent from SESs that are material for the organisation's value-creation. Therefore, not all SES cues are recognised and anticipated equally. Shocks and disturbances can be both positive and negative impacts on the organisation. Secondly, through reporting and monitoring, the IR helps to consolidate managers' understanding of the organisations' progress towards different financial & non-financial targets. Thirdly, the process of IR can foster the connectivity of information over time and helps managers better interpret lower-order systems at the department level. Fourth, IR can drive internal processes which subsequently promote adaptive management allowing managers to deal with and recover from disturbances in SESs more quickly. However, due to IR not fostering a complex adaptive systems perspective, managers may not fully apprehend the impacts of their adaptive efforts on the SES. Fifth, IR creates the opportunity for holistic feedback and tightened feedback loops from external stakeholder engagement. In turn, managers can become aware of how the SES is changing while also holding them accountable to deliver their sustainability promises. By returning to IR year after year, the framework disciplines the organisation to increase the quality of their non-financial reporting cycles. Likewise, it can support integrated decision-making to streamline the operationalisation of the organisations' value-creating strategy. Theoretical sequence of events is likely to vary in real-world settings.

5. Discussions

This section aims to discuss the implications of the findings in relation to the literature presented earlier on.

5.1. Panarchical connections

Firstly, the findings of this thesis suggested that IR drives managers' awareness of the interrelationship between the organisation and the SES in which the firm is embedded. Moreover, IR was found to foster managers' awareness of their organisation's double materiality impacts across multiple areas. Moreover, the findings revealed that IR supports connectivity of information throughout the organisation and can therefore embed integrated thinking. This allows managers to better understand lower-order linkages between the firm level and the different department levels.

Referring to panarchical connections as mentioned by Gunderson & Holling (2002) managers must consider information across nested systems. In this way, the findings suggest IR can extend managers' understanding of how individual organisational units interact with the SES. However, this thesis found that IR predominantly draws managers' attention to matters that are material for the organisation, and not necessarily on viewing a holistic perspective between the individual components of ecosystem services that the firm depends upon. Therefore, this research acknowledged the academic criticism of IR stating insufficient focus on system-level sustainability (Thomson, 2015; Flower, 2015). This thesis found that IR remains centred on optimising organisational resilience. Therefore, IR may inadequately support managers with vital information concerning critical cross-scale interactions, ecosystem boundaries, and precariousness that may eventually lead to a regime shift (Williams et al., 2021). Thus, IR does not foster a complex adaptive systems perspective. One plausible explanation for this may be due to IR interpreting sustainability in terms of risks and opportunities. As a result, only information that is deemed substantive enough to affect the organisations value creating ability gets interpreted, potentially leaving out important SES cues.

5.2. Timescales & speed

The findings highlighted how IR helps to provide managers with information on slow-moving variables such as climate change, biodiversity loss, or tightening local labour markets. On the other hand, managers highlighted how IR is not dynamic enough to identify disturbances that spread through the SES quickly, such as COVID-19.

In relation to the literature, there is evidence that IR can facilitate managers' discovery and understanding of the pace of change occurring within ecosystems (Williams et al., 2021). Similarly, IR may inform managers of how slow-moving variables respond to their firms' actions. Still, in light of the aforementioned discussion point, IR was not found to recognise and monitor SESs threshold limits adequately. In this regard, IR does not support managers with appropriate information of changes caused by slow-moving variables which Williams et al., (2021) argue may lead to a decline of C-SR. To this end, managers may experience longer time delays and thus respond too late to avoid the consequences of ecosystems crossing over to a new regime (Williams et al., 2021). One reason why IR forgoes information on timescales may be because the whole approach to climate risk assessments is far beyond the current business horizon of 3-5 years, with climate risks only manifesting materially in the longer term. This timescale gap seems to require a different assumption and a more realistic model that underpins the way managers approach climate-related risks.

Furthermore, the findings contradict those of Simnett & Huggins (2015) in that IR was not found to provide managers with timely and forward-looking information within a management cycle. This can be attributed to IR being a compilation of annual data that managers expressed was already outdated to act upon.

5.3. Feedback loops

The findings highlighted that IR promotes holistic feedback and catalyses broadened participation through active engagement with relevant stakeholders. This was found to enlighten managers' understanding of emergent changes in the SES as well as unnoticed feedback effects. Furthermore, this thesis found that stakeholder feedback on the IR can have managers question and redefine their organisation's goals, activities, and even strategic intent.

In relation to the literature, IR was found to fulfil its 'transformation function' as argued by Eccles et al., (2014) which additionally can act as a process to tighten feedback loops. In turn, managers have a greater appreciation of system dynamics and are in a better position to detect and act earlier to shocks and changes brought by SESs (Biggs et al., 2012). Likewise, since stakeholders provide perspective on both financial and non-financial matters, IR can potentially shift managers' thinking to a more holistic perspective as was confirmed by Eccles & Krzus, (2010). Moreover, as stakeholders influence organisational decision-making, IR may facilitate the adoption of governance structures that amplify SESs (Biggs et al., 2012). Still, on only one occasion could the findings confirm the ideas of Dentoni et al., (2021) that increased stakeholder dialogues, because of IR further prompted cross-sector partnerships.

5.4. Adaptive management

The findings suggested that IR encourages learning and cohesive governance structures which can strengthen the organisations' adaptive capacity. Furthermore, managers have a better understanding of their organisations' value-creation because of IR. Similarly, IR encourages managers to think about how certain topics might be more firmly embedded in the strategy. Additionally, IR was found to drive the operationalisation of the organisations' value-creation. Finally, IR disciplines managers to become more rigorous about their non-financial disclosures and reporting cycles which can reinforce the prior finding.

In relation to the literature, consistent with Barth et al., (2017) IR led to greater internal collaboration which enabled adaptation to management approaches. In turn, IR supports management's ability to respond to and absorb shocks originating from SESs. In this regard, IR can be a mechanism to reinforce organisations' adaptability to influence the resilience of SESs (Walker et al., 2004).

Moreover, in line with Simnett & Huggins (2015) managers are likely to gain a better understanding of how firms' capitals relate to their strategic goals. Therefore, IR seems to be a mechanism to optimise and operationalise the organisations' value-creating strategy rather than contributing to C-SR. Lastly, it's important to recognise that the organisations' adaptive management efforts may enhance C-SR, however, IR was not found to support managers to do so purposefully.

6. Limitations & Future Research

Several limitations of this research need to be acknowledged. Firstly, because IR is a voluntary framework with varying practices the selection of the participants recruited for the interviews followed a rather subjective approach. The Transparency Benchmark (Ministry of Economic Affairs and Climate Policy, 2022b) provides a ranking of companies with the best CSR/sustainability reporting transparency within The Netherlands and was the reference for selecting organisations. For practical reasons, not all companies figuring on that list were interviewed. Moreover, only the testimonials of people who accepted to take part in this interview were captured. Naturally, some e-mails and LinkedIn invitations were left unanswered or ignored. This is a limitation because it moderately resulted in a population bias, potentially skewing the findings. Moreover, 5/13 participants represented the bank & insurance industry also distorting the results. Additionally, the far majority of interviewees were either IR reporting or sustainability managers, therefore, limiting the understanding of how IR may support managers within organisations. Thus, to increase both internal and external validity, it is encouraged that future research focuses on garnering diverse candidates working in various organisational departments, from randomly selected companies that adopt IR on an annual basis.

In line with the previous point, a relatively limited sample size of 13 interviews were conducted for this research. Some ground theorists consider that 25 interviews are sufficient to achieve theoretical saturation (Charmaz, 2006). The limitation of a small sample size is associated with low reproducibility, and perhaps an overestimated effect size from the findings. Therefore, future research could conduct the same study with a larger pool of data collection or perform follow-up interviews with these participants.

Furthermore, this research can only produce findings applicable to the Netherlands. Globally, firms might have a different approach to IR resulting in a different dynamic when it comes to C-SR. The sample consisted exclusively of large companies, thereby limiting the transferability of the findings to other types of organisations. Hence further studies adopting a similar research question and grounded theory approach could focus on companies with other business structures (i.e., SMEs, non-profits), operating in broadened locations (i.e., EU/international), or different sectors (i.e., primary, tertiary, public) to have a better understanding of this relationship and see if there is a pattern in results. In light of this thesis' findings, it would be interesting for future research to examine how IR encourages adaptive management practices to influence the resilience of SES, or what mechanisms can managers use in relation to IR to foster a complex adaptive systems perspective and navigate for C-SR?

Finally, socio-cultural limitations can be observed in this paper in the form of translation inexactitudes. As a matter of fact, 10 out of 13 interviews were conducted in Dutch (and 3 in English). From a language perspective, translations can be a source of misinterpretations and hence produce different coding themes or aggregate dimensions. On the one hand, the help of an official translator could increase internal validity, or on the other hand, resorting to a quantitative approach can eliminate interpretations. Likewise, the qualitative approach is generally more susceptible to bias and inaccuracy. To increase both external and internal validity, the present research could greatly benefit from focus groups, and/or quantitative survey follow-ups to improve robustness. Focus groups would allow participants to bring diverse perspectives together, while a survey would gather information from a larger population sample. Such mixed methods would help reduce most socio-cultural barriers among others.

7. Conclusions

This research explored how IR supports managers to navigate for C-SR. On the one hand, the findings revealed that IR catalyses managers' awareness and ability to manage for their organisations' double materiality. Notably, IR supports the identification of slow-moving variables and less so for fast-moving ones. Furthermore, IR tightens a more holistic feedback process through active engagement with relevant stakeholders. Finally, IR allows managers to better interpret lower-order connections within the organisation and encourages adaptive management. In this regard, IR can be a mechanism to strengthen organisations' adaptability to influence the resilience of SESs.

On the other hand, this research discovered that IR does not foster a complex adaptive systems perspective and remains focused on optimising organisational resilience. Oftentimes IR fails to provide managers with a holistic understanding of the interactions between individual components of a SES. Moreover, IR was not found to adequately support managers with vital information about important ecosystem services, where SESs thresholds lie, and precariousness. In turn, managers using IR cannot accurately manage and respond to consequential changes that may eventually lead to SESs crossing threshold limits. Likewise, managers will not fully understand how their sustainability efforts impact resilience across scales of SESs. Therefore, according to this research IR can only partially support managers to navigate for C-SR.

The findings of this thesis also confirm the results of existing literature with regards to IR encouraging managers to adopt a more holistic perspective of the organisation (Eccles & Krzus, 2010), as well as improving internal decision-making (Barth et al., 2017). Thus, this thesis broadens a new path for scholars' understanding by shedding light on IR as a strengthening mechanism that fosters organisations' adaptive capacity.

Furthermore, this thesis found that IR fulfils both its 'transformation' and 'information' functions as alluded to by Eccles, Ioannou & Serafeim, (2014) which the present findings support tightened feedback loops through active engagement with relevant stakeholders. Managers can therefore more holistically detect and act on shocks and changes occurring in SESs earlier. Furthermore, this thesis shares some accordance with previous academic's critique of IR (Thomson, 2015; Flower, 2015) in that IR interprets sustainability in terms of what is deemed substantive enough to affect the organisations' value-creating ability, thus possibly leaving out important SES cues.

These collective results can have significant implications for managers who wish to better understand the role of IR in their journey for a more sustainable future. A key implication is that IR provides managers with a better understanding of the interrelationship between the organisation and the SES in which the firm is embedded. Therefore, IR can make managers increasingly aware of their organisation's double materiality across multiple areas. In turn, managers will be in a better position to anticipate how adverse changes from SESs may affect their organisation, and what role their organisation has on the socio-ecological environment.

Secondly, IR can allow managers to gain a more thorough understanding of how their organisations' departments link to its value creation and their connection to SESs. For example, managers may more accurately pinpoint which certain parts of the organisation are responsible for progress towards its non-financial targets, such as carbon emissions. In light of the findings, it seems important for managers to consider doing something with their IR findings and incorporate them into their business operations and management approach. Bureaucratically

reporting IR annually will unlikely reap its full benefits. Moreover, IR may discipline the organisation to gradually improve and become more ambitious about its overall non-financial reporting cycles, bringing them to the same level of scrutiny of their financial information. Auditing one's IR can boost this effect. Overall, this can help to improve organisations' adaptive capacity to be able to respond quickly to changes occurring in SESs. Equally, it can more cohesively streamline how the organisation operationalises its strategy.

Thirdly, IR stimulates a greater holistic feedback opportunity from stakeholders, not only on the organisations' value-creating direction but also on changes occurring in SESs that may have gone unnoticed.

Finally, managers must beware that IR may fall short for them to respond and enhance the C-SR of SESs. Therefore, it is not advised to use IR in isolation in this context. To ensure one does not succumb to narrowly interpreting resilience in terms of the organisation, managers should make use of other instruments to balance out IR's shortcomings. Hence IR can be a supplement to manage for C-SR. Here participation and application of other sustainability reporting standards, benchmarks - and increasingly governmental enforcements -, will highlight a more complete picture of how scales behave within SESs. The amalgamation can support managers' understanding of their organisation's role to contribute to the resilience of SESs.

To conclude tremendous effort will be necessary the coming decades to turn the tides on climate change. Organisations can play a significant role in this by understanding and enhancing C-SR to re-balance SESs. IR practices may partially support to bridge this gap within the boundaries of the organisations' value-creation. However other practices will need to be incorporated before managers can fully appreciate system dynamics. In doing so organisations may support socio-ecological systems to thrive, while also securing their own longevity. Yet, much remains to be understood to ensure organisations' sustainability efforts are channelled to support planet Earth's ecosystems.

Bibliography

Adams, C. (2013). Understanding Integrated Reporting. doi: 10.4324/9781351275002

Adams, C. (2015). The International Integrated Reporting Council: A call to action. *Critical Perspectives On Accounting*, *27*, 23-28. doi: 10.1016/j.cpa.2014.07.001

Aras, G., & Crowther, D. (2008). Corporate Sustainability Reporting: A Study in Disingenuity? *Journal Of Business Ethics*, *87*(S1), 279-288. doi: 10.1007/s10551-008-9806-0

Barasa, E., Mbau, R., & Gilson, L. (2018). What Is Resilience and How Can It Be Nurtured? A Systematic Review of Empirical Literature on Organizational Resilience. *International Journal Of Health Policy And Management*, *7*(6), 491-503. doi: 10.15171/ijhpm.2018.06

Barth, M., Cahan, S., Chen, L., & Venter, E. (2017). The economic consequences associated with integrated report quality: Capital market and real effects. *Accounting, Organizations And Society*, *62*, 43-64. doi: 10.1016/j.aos.2017.08.005

Bell, E., Bryman, A., & Harley, B. (2019). *Business research methods* (5th ed.). Oxford, United Kingdom; New York, NY: Oxford University Press.

Brown, J., & Dillard, J. (2014). Integrated reporting: On the need for broadening out and opening up. *Accounting, Auditing & Accountability Journal*, *27*(7), 1120-1156. doi: 10.1108/aaaj-04-2013-1313

Carl Folke, Steve Carpenter, Thomas Elmqvist, Lance Gunderson, C. S. Holling, and Brian Walker. (2002). "Resilience and Sustainable Development: Building Adaptive Capacity in a World of Transformations," AMBIO: A Journal of the Human Environment 31(5), 437-440, https://doi.org/10.1579/0044-7447-31.5.437

Chapin, F. S. III, Kofinas, G. P. and Folke, C. (2009). Principles of Ecosystem Stewardship: Resilience-Based Natural Resource Management in a Changing World. New York: Springer-Verlag.

Charmaz, K. (2006). Constructing Grounded Theory: A Practical Guide through Qualitative Analysis. London: Sage Publications.

Charmaz, K., (2014). Constructing Grounded Theory. Thousand Oaks, California: SAGE Publications.

Churet, C., Robeco, S.A.M. and Eccles, R.G. (2014). Integrated Reporting, Quality of Management and Financial Performance. Journal of Applied Corporate Finance, 26, 56-64.

Churet, Cécile and Eccles, Robert G., Integrated Reporting, Quality of Management, and Financial Performance (2014). Journal of Applied Corporate Finance, Vol. 26, Issue 1, pp. 56-64, 2014, Available at SSRN: https://ssrn.com/abstract=2422151 or http://dx.doi.org/10.1111/jacf.12054

Clément, V., & Rivera, J. (2016). From Adaptation to Transformation: An Extended Research Agenda for Organizational Resilience to Adversity in the Natural Environment. *Organization & Environment*, *30*(4), 346-365. doi: 10.1177/1086026616658333

Clément, V., & Rivera, J. (2017). From Adaptation to Transformation: An Extended Research Agenda for Organizational Resilience to Adversity in the Natural Environment. Organization & Environment, 30(4), 346–365. https://doi.org/10.1177/1086026616658333

Corbin, J., & Strauss, A. (2008). *Basics of qualitative research (3rd ed.): Techniques and procedures for developing grounded theory*. SAGE Publications, Inc. https://dx.doi.org/10.4135/9781452230153

Creswell, J. (2013). *Qualitative inquiry and research design (3rd ed.): choosing among five approaches.* California: SAGE Publications, Inc.

Creswell, J. W. (2007). *Qualitative inquiry and research design: Choosing among five approaches* (2nd ed.). Sage Publications, Inc.

Dentoni, D., Pinkse, J., & Lubberink, R. (2021). Linking Sustainable Business Models to Socio-Ecological Resilience Through Cross-Sector Partnerships: A Complex Adaptive Systems View. *Business & Society*, 60(5), 1216-1252. doi.org/10.1177/0007650320935015

Denzin, N. K., & Lincoln, Y. S. (2011). The SAGE Handbook of Qualitative Research. Thousand Oaks, CA: Sage.

Diener, E., & Crandall, R. (1978). *Ethics in social and behavioral research.* U Chicago Press.

Eccles, R., Ioannou, I., & Serafeim, G. (2014). The Impact of Corporate Sustainability on Organizational Processes and Performance. *Management Science*, *60*(11), 2835-2857. doi: 10.1287/mnsc.2014.1984

Eccles, Robert G. and Serafeim, George, Corporate and Integrated Reporting: A Functional Perspective (January 31, 2014). Chapter 9 in Corporate Stewardship: Achieving Sustainable Effectiveness, edited by Ed Lawler, Sue Mohrman, and James O'Toole, Greenleaf, 2015., Available at SSRN: https://ssrn.com/abstract=2388716 or http://dx.doi.org/10.2139/ssrn.2388716

Eccles, Robert G., and Michael Krzus. (2010). One Report: Integrated Reporting for a Sustainable Strategy. New York: John Wiley & Sons

Farooq, M.B. and de Villiers, C. (2019), "Understanding how managers institutionalise sustainability reporting: Evidence from Australia and New Zealand", Accounting, Auditing & Accountability Journal, Vol. 32 No. 5, pp. 1240-1269. https://doi.org/10.1108/AAAJ-06-2017-2958

Flower, J. (2015). The International Integrated Reporting Council: A story of failure. *Critical Perspectives On Accounting*, *27*, 1-17. doi: 10.1016/j.cpa.2014.07.002

Folke, C., Biggs, R., Norström, A.V., Reyers, B., & Rockström, J. (2016). Social-ecological resilience and biosphere-based sustainability science. *Ecology and Society, 21*.

Folke, C., Carpenter, S., Walker, B., Scheffer, M., Chapin, T., & Rockström, J. (2010). Resilience Thinking: Integrating Resilience, Adaptability and Transformability. *Ecology And Society*, *15*(4). doi: 10.5751/es-03610-150420

Geertz, C. (1973). The interpretation of cultures: selected essays. New York: Basic Books.

Gioia, D. A., Corley, K. G., & Hamilton, A. L. (2013). Seeking Qualitative Rigor in Inductive Research: Notes on the Gioia Methodology. Organizational Research Methods, 16(1), 15–31. https://doi.org/10.1177/1094428112452151

Gittell, J. H., Cameron, K., Lim, S. and Rivas, V. (2006). Relationships, layoffs, and organizational resilience: Airline industry responses to September 11. *Journal of Applied Behavioral Science*, **42**(3), pp. 300-329.

Gray, R. (2010). Is accounting for sustainability actually accounting for sustainability…and how would we know? An exploration of narratives of organisations and the planet. *Accounting, Organizations And Society*, *35*(1), 47-62. doi: 10.1016/j.aos.2009.04.006

Gray, R. H. (2006). Social, Environmental and Sustainability Reporting and Organisational Value Creation: Whose Value? Whose creation? Accounting, Auditing & Accountability Journal, 19(6), 793-819. Retrieved from: https://doi.org/10.1108/09513570610709872

Gunderson, L. H., & Holling, C. S. (2002). Panarchy: Understanding transformations in human and natural systems. Washington, DC: Island Press.

Hahn, T., & Figge, F. (2011). Beyond the Bounded Instrumentality in Current Corporate Sustainability Research: Toward an Inclusive Notion of Profitability. *Journal Of Business Ethics*, *104*(3), 325-345. doi: 10.1007/s10551-011-0911-0

Henriques, A., & Richardson, J. (2004). The triple bottom line: Does it addup? London: Earthscan.

Higgins, C., Stubbs, W., Tweedie, D., & McCallum, G. (2019). Journey or toolbox? Integrated reporting and processes of organisational change. *Accounting, Auditing & Accountability Journal*, *32*(6), 1662-1689. doi: 10.1108/aaaj-10-2018-3696

Hoffman, Andrew John, The Next Phase of Business Sustainability (January 1, 2018). Stanford Social Innovation Review, 16(2): 34-39., Ross School of Business Paper No. 1381, Available at SSRN: https://ssrn.com/abstract=3191035 or http://dx.doi.org/10.2139/ssrn.3191035

Howard-Grenville, J., & Lahneman, B. (2021). Bringing the biophysical to the fore: Re-envisioning organizational adaptation in the era of planetary shifts. *Strategic Organization*, *19*(3), 478-493. doi: 10.1177/1476127021989980

International Integrated Reporting Council (IIRC). (2021). International integrated reporting framework. Retrieved from: https://www.integratedreporting.org/wp-content/uploads/2021/01/InternationalIntegratedReportingFramework.pdf

IIRC. (2020). *10 Years of the IIRC*. Retrieved from Integrated Reporting : https://www.integratedreporting.org/10-years/10-years-summary/

International Financial Reporting Standards (IFRS) Foundation. (2022, August 01). *IFRS Foundation completes consolidation with Value Reporting Foundation*. Retrieved from IFRS: https://www.ifrs.org/news-and-events/news/2022/08/ifrs-foundation-completes-consolidation-with-value-reporting-foundation/

IFRS Foundation. (2022). *Analysing the use of IFRS Accounting Standards*. Retrieved from IFRS: https://www.ifrs.org/use-around-the-world/use-of-ifrs-standards-by-jurisdiction/#analysis-of-use-of-ifrs-accounting-standards-around-the-world

Kvale, S. (1996). Interview Views: An Introduction to Qualitative Research Interviewing. Thousand Oaks, CA: Sage Publications.

Kvale, S. (2007) Doing Interviews. Sage Publications, Thousand Oaks. http://dx.doi.org/10.4135/9781849208963

Lincoln, YS. & Guba, EG. (1985). Naturalistic Inquiry. Newbury Park, CA: Sage Publications.

Linnenluecke, M. (2015). Resilience in Business and Management Research: A Review of Influential Publications and a Research Agenda. *International Journal Of Management Reviews*, *19*(1), 4-30. doi: 10.1111/ijmr.12076

Linnenluecke, M. K. (2015). Resilience in business and management research: A review of influential publications and a research agenda. International Journal of Management Reviews, 19, 3-40.

Linnenluecke, M., & Griffiths, A. (2010). Beyond Adaptation: Resilience for Business in Light of Climate Change and Weather Extremes. *Business & Society*, *49*(3), 477-511. doi: 10.1177/0007650310368814

Linnenluecke, M., Griffiths, A., & Winn, M. (2013). Firm and industry adaptation to climate change: a review of climate adaptation studies in the business and management field. Wiley Interdisciplinary Reviews: Climate Change, 4(5), 397-416. doi: 10.1002/wcc.214

Lodhia, S. (2015). Exploring the Transition to Integrated Reporting Through a Practice Lens: An Australian Customer Owned Bank Perspective. *J Bus Ethics* 129, 585–598. https://doi.org/10.1007/s10551-014-2194-8

Luthans, F. (2002). The need for and meaning of positive organizational behavior. Journal of Organizational Behavior, 23, 695-706.

Martí , I. (2018). Transformational business models, grand challenges, and social impact. *Journal of Business Ethics 152(4)*, 965–976.

McKnight, B., & Linnenluecke, M. (2016). How Firm Responses to Natural Disasters Strengthen Community Resilience. Organization & Environment, 29(3), 290-307. doi: 10.1177/1086026616629794

Milne, M., & Gray, R. (2012). W(h)ither Ecology? The Triple Bottom Line, the Global Reporting Initiative, and Corporate Sustainability Reporting. *Journal Of Business Ethics*, *118*(1), 13-29. doi: 10.1007/s10551-012-1543-8

Ministry of Economic Affairs and Climate Policy. (2022a). *About Transparency Benchmark*. From Transparency Benchmark: https://www.transparantiebenchmark.nl/en/about-transparency-benchmark

Ministry of Economic Affairs and Climate Policy. (2022b). *Scores Year 2021*. From Transparency Benchmark: https://www.transparantiebenchmark.nl/en/scores-0#/survey/14

Montiel, I., Gallo, P.J. & Antolin-Lopez, R. (2020). What on Earth Should Managers Learn About Corporate Sustainability? A Threshold Concept Approach. J Bus Ethics 162, 857–880. https://doi.org/10.1007/s10551-019-04361-y

Omran, M., Zaid, M., & Dwekat, A. (2020). The relationship between integrated reporting and corporate environmental performance: A green trial. *Corporate Social Responsibility And Environmental Management*, *28*(1), 427-445. doi: 10.1002/csr.2059

Orr, A., & Donovan, J. (2018). Introduction to special issue: smallholder value chains as complex adaptive systems. *Journal of Agribusiness in Developing and Emerging Economies, 8(1)*, 2-13.

Ortiz-de-Mandojana, N., & Bansal, P. (2015). The long-term benefits of organizational resilience through sustainable business practices. *Strategic Management Journal*, *37*(8), 1615-1631. doi: 10.1002/smj.2410

Perego, P., Kennedy, S., & Whiteman, G. (2016). A lot of icing but little cake? Taking integrated reporting forward. *Journal of Cleaner Production 136.10* , 53-64 .

Simnett, R., & Huggins, A. (2015). Integrated reporting and assurance: where can research add value?. *Sustainability Accounting, Management And Policy Journal*, *6*(1), 29-53. doi: 10.1108/sampj-09-2014-0053

Stacchezzini, R., Melloni, G., & Lai, A. (2016). Sustainability management and reporting: the role of integrated reporting for communicating corporate sustainability management. *Journal Of Cleaner Production*, *136*, 102-110. doi: 10.1016/j.jclepro.2016.01.109

Steffen, W., Richardson, K., Rockström, J., Cornell, S., Fetzer, I., & Bennett, E. et al. (2015). Planetary boundaries: Guiding human development on a changing planet. *Science*, *347*(6223). doi: 10.1126/science.1259855

Steyn, M. (2014). Organisational benefits and implementation challenges of mandatory integrated reporting. *Sustainability Accounting, Management And Policy Journal*, *5*(4), 476-503. doi: 10.1108/sampj-11-2013-0052

Stubbs, W., & Higgins, C. (2014). Integrated Reporting and internal mechanisms of change. Accounting, Auditing & Accountability Journal, 27(7), 1068-1089. doi: 10.1108/aaaj-03-2013-1279

Tashman, P. and Rivera, J. (2016). Ecological uncertainty, adaptation, and mitigation in the U.S. ski resort industry: Managing resource dependence and institutional pressures. Strat. Mgmt. J., 37, 1507-1525. https://doi-org.eur.idm.oclc.org/10.1002/smj.2384

The International Integrated Reporting Council (IIRC). (2020). *Integrated Thinking & Strategy State of play report.* London: The International Integrated Reporting Council. From https://www.integratedreporting.org/wp-content/uploads/2020/01/Integrated-Thinking-and-Strategy-State-of-Play-Report_2020.pdf

Thomson, I. (2015). 'But does sustainability need capitalism or an integrated report' a commentary on 'The International Integrated Reporting Council: A story of failure' by Flower, J. *Critical Perspectives On Accounting*, *27*, 18-22. doi: 10.1016/j.cpa.2014.07.003

Value Reporting Foundation. (2015, July 15). *More than a third of Dutch listed companies are working towards <IR>*. From Integratedreporting: https://www.integratedreporting.org/news/more-than-a-third-of-dutch-listed-companies-are-working-towards/

Vesty, G., Ren, C., & Ji, S. (2018). Integrated reporting as a test of worth. *Accounting, Auditing & Accountability Journal*, *31*(5), 1406-1434. doi: 10.1108/aaaj-08-2016-2684

Vesty, G.M., Ren, C. and Ji, S. (2018). Integrated reporting as a test of worth: A conversation with the chairman of an integrated reporting pilot organisation. Accounting, Auditing & Accountability Journal, Vol. 31 No. 5, pp. 1406-1434. https://doi.org/10.1108/AAAJ-08-2016-2684

Vigneau, L. and Humphreys, M. and Moon, J. (2015). How do firms comply with international sustainability standards? Processes and consequences of adopting the global reporting initiative. Journal of business ethics., 131 (2). pp. 469-486.

Walker, B. H. 1., & Salt, D. (2012). Resilience practice: building capacity to absorb disturbance and maintain function. Washington, DC: Island Press.

Walker, B., & Salt, D. (2006). Resilience Thinking Sustaining Ecosystems and People in a Changing World. Washington, DC: Island Press.

Walker, B., C. S. Holling, S. R. Carpenter, and A. Kinzig. (2004). Resilience, adaptability, and transformability in social–ecological systems. Ecology and Society 9(2): 5. [online] URL: http://www.ecologyandsociety.org/vol9/iss2/art5/

Weick, K. (1993). The collapse of sensemaking in organizations: The Mann Gulch disaster. Administrative Science Quarterly, 38, 628-652.

Weick, K. E., & Sutcliffe, K. M. (2001). *Managing the unexpected: Assuring high performance in an age of complexity.* Jossey-Bass.

Williams, A., Kennedy, S., Philipp, F., & Whiteman, G. (2017). Systems thinking: A review of sustainability management research. *Journal Of Cleaner Production*, *148*, 866-881. doi: 10.1016/j.jclepro.2017.02.002

Williams, A., Whiteman, G., & Kennedy, S. (2021). Cross-Scale Systemic Resilience: Implications for Organization Studies. *Business & Society*, *60*(1), 95-124. doi: 10.1177/0007650319825870

Williams, A.N. (2018). Make Our Planet Great Again: A Systems Perspective of corporate sustainability. Erasmus University Rotterdam. Retrieved from: http://hdl.handle.net/1765/111032

Williams, T. A., Gruber, D. A., Sutcliffe, K. M., Shepherd, D. A., & Zhao, E. Y. (2017). Organizational response to adversity: Fusing crisis management and resilience research streams. Academy of Management Annals, 11, 1-70.

World Economic Forum. (2020, January 19). *Half of World's GDP Moderately or Highly Dependent on Nature, Says New Report*. From www.weforum.org: https://www.weforum.org/press/2020/01/half-of-world-s-gdp-moderately-or-highly-dependent-on-nature-says-new-report/

Appendices

Appendix A. Content elements of the <IR> Framework

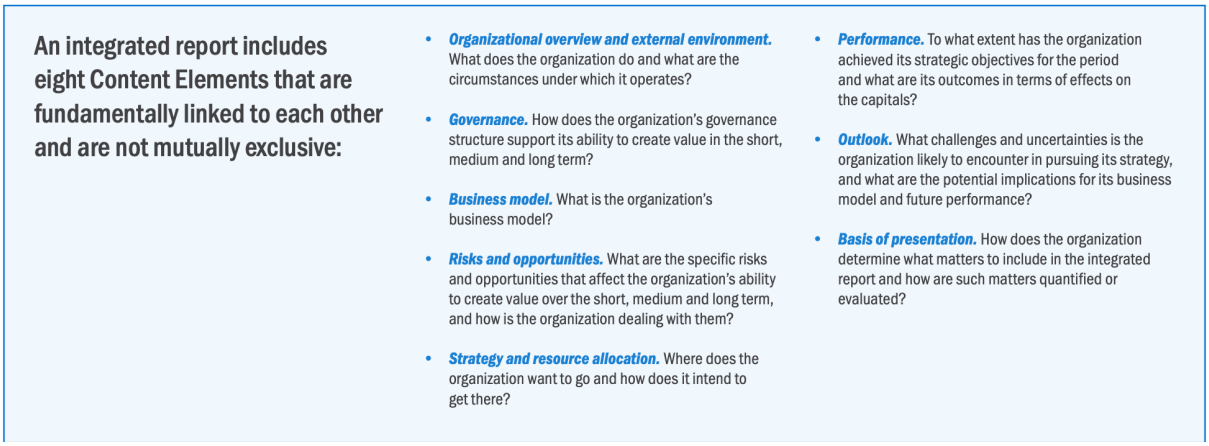

Figure 6. *Eight content elements in the international <IR> Framework (IR, 2021, p.38)*

Appendix B. Guiding principles of the <IR> Framework

Figure 7. *Seven guiding principles in the <IR> Framework (IR, 2021, p.25)*

Appendix C. Six capitals of the <IR> Framework

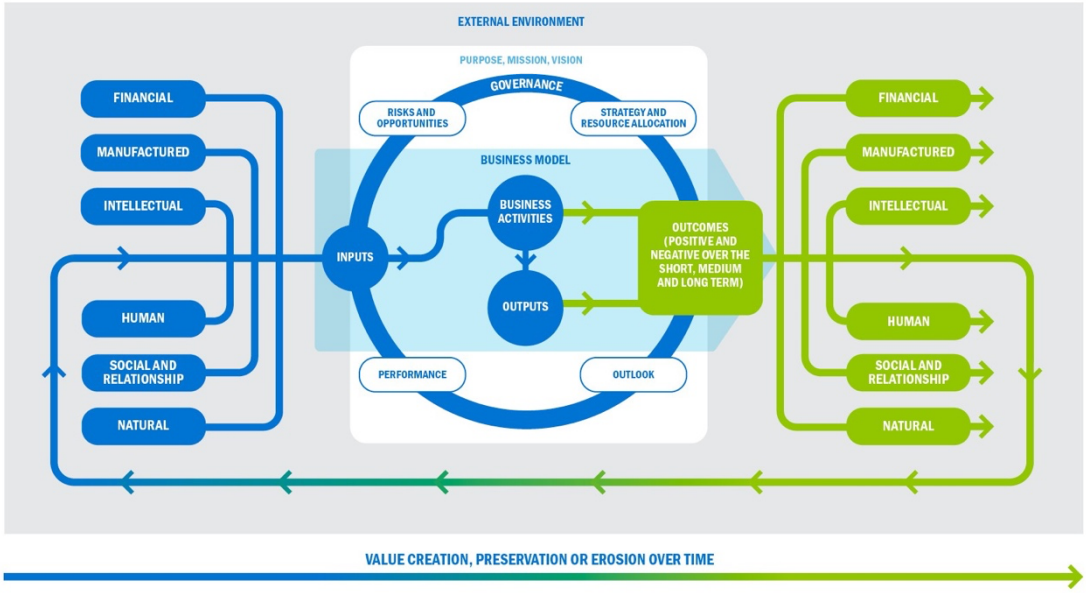

Figure 8. *Process through which value is created, preserved, or eroded in the international <IR> framework (IR, 2021, p.22)*

- ***Financial capital*** – The pool of funds that is:
  - Available to an organization for use in the production of goods or the provision of services
  - Obtained through financing, such as debt, equity or grants, or generated through operations or investments.
- ***Manufactured capital*** – Manufactured physical objects (as distinct from natural physical objects) that are available to an organization for use in the production of goods or the provision of services, including:
  - Buildings
  - Equipment
  - Infrastructure (such as roads, ports, bridges, and waste and water treatment plants).

  Manufactured capital is often created by other organizations, but includes assets manufactured by the reporting organization for sale or when they are retained for its own use.
- ***Intellectual capital*** – Organizational, knowledge-based intangibles, including:
  - Intellectual property, such as patents, copyrights, software, rights and licences
  - "Organizational capital" such as tacit knowledge, systems, procedures and protocols.
- ***Human capital*** – People's competencies, capabilities and experience, and their motivations to innovate, including their:
  - Alignment with and support for an organization's governance framework, risk management approach, and ethical values
  - Ability to understand, develop and implement an organization's strategy
  - Loyalties and motivations for improving processes, goods and services, including their ability to lead, manage and collaborate.
- ***Social and relationship capital*** – The institutions and the relationships within and between communities, groups of stakeholders and other networks, and the ability to share information to enhance individual and collective well-being.

  Social and relationship capital includes:
  - Shared norms, and common values and behaviours
  - Key stakeholder relationships, and the trust and willingness to engage that an organization has developed and strives to build and protect with external stakeholders
  - Intangibles associated with the brand and reputation that an organization has developed
  - An organization's social licence to operate.
- ***Natural capital*** – All renewable and non-renewable environmental resources and processes that provide goods or services that support the past, current or future prosperity of an organization. It includes:
  - Air, water, land, minerals and forests
  - Biodiversity and eco-system health.

Figure 9. *Six capitals in the <IR> Framework (IR, 2021, p.19)*

Appendix D. Example interview protocol

Introduction

- Introduce myself and the research topic
- Ask participants if they would like to introduce themselves.

Formalities

- Ask for permission to record the interview.
- Ask participants if they would like to approve the transcript and/or statements that will be used in the thesis afterward.
- Inform participants all data will be anonymized and only used for the purpose of this research.
- Inform participants they do not need to answer any questions they do not wish to.

Interview questions

- What is your position within the organisation & what is your involvement with the organisation's integrated reporting process?
- How is the integrated report used in your organisation? Are there different applications? How do you use it personally?
- To what extent does integrated reporting help the organisation focus on sustainability?
- What changes to the organisation's sustainability strategy have you noticed through the implementation of the integrated report?
- How does an integrated report help you to better understand short- and long-term changes in society and the natural environment?
- How does an Integrated Report help you understand the relationship between your organisation and the natural environment?
- To what extent does integrated reporting make the organisation more resilient?
- How does an integrated report help prepare you for the future?
- How does integrated reporting help to manage for shocks and disturbances?

Concluding questions and remarks

- Is there anything else you find important that you would like to add to this topic, or that you feel we have not addressed?
- Ask if the participant wishes to receive a final version of the thesis.
- Ask if the participant knows other people who would be willing to participate.
- Thank participant for the interview.

Appendix E. Screenshot of coding

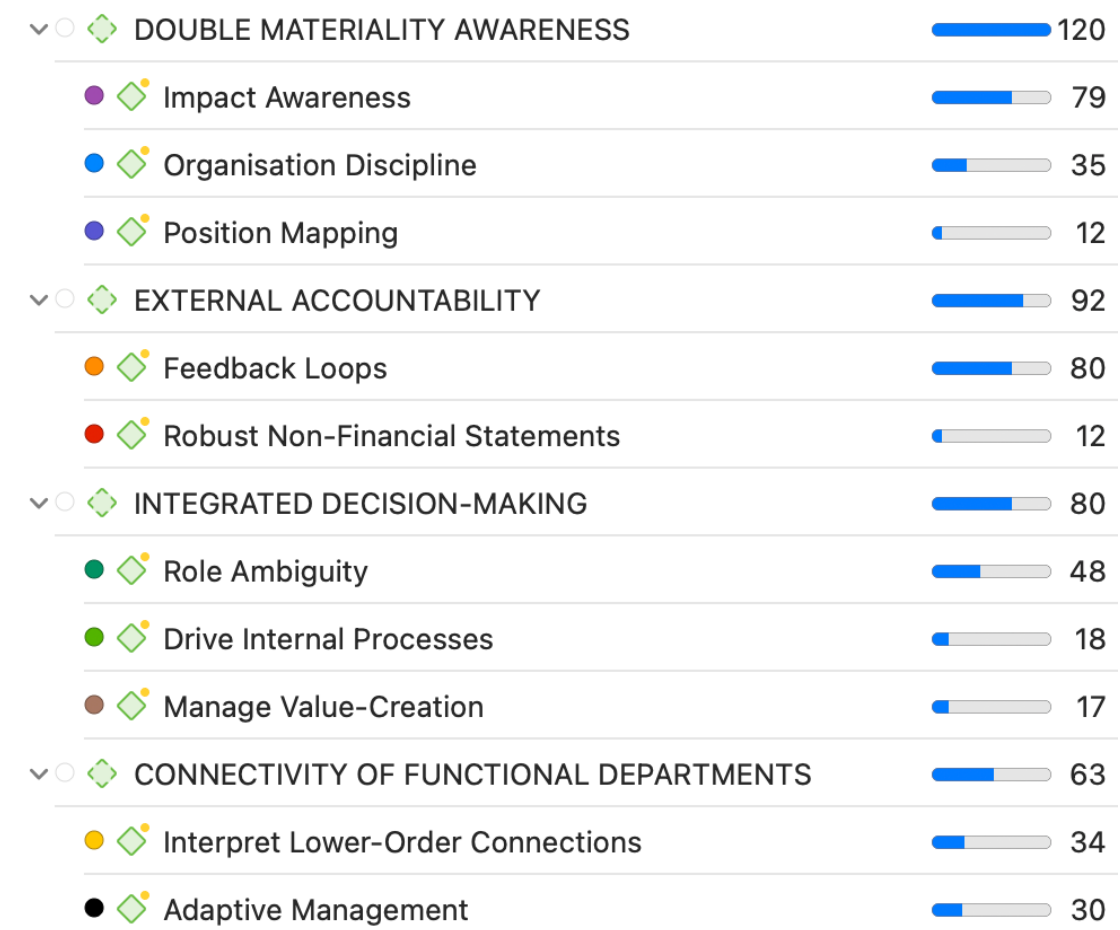

Figure 10. *Screenshot of coding manager in Atlas.ti*

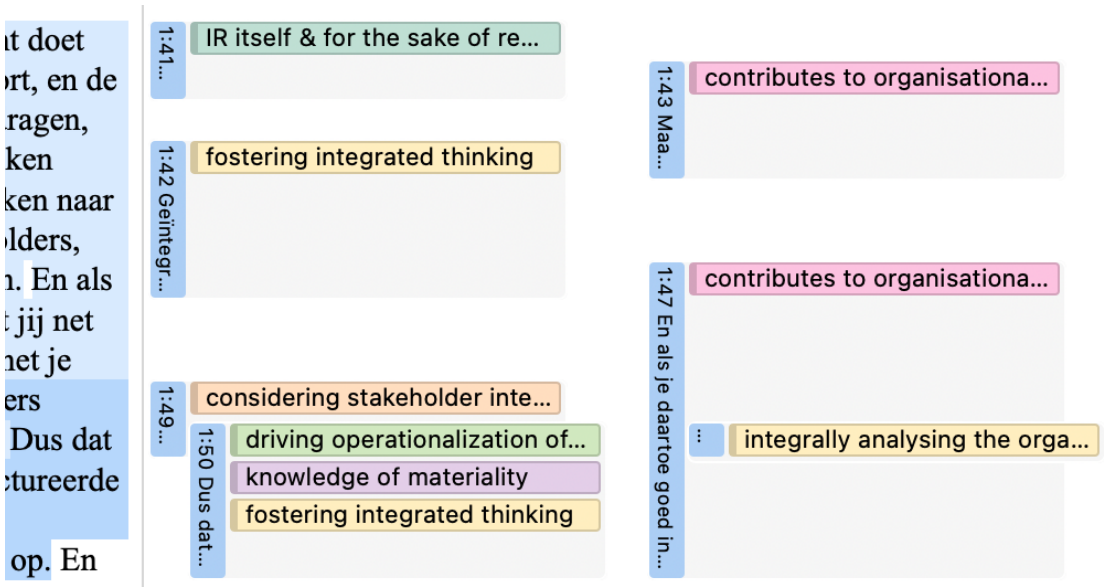

Figure 11. *Screenshot of coded interview in Atlas.ti*