



**Enhancing the materiality principle in Integrated Reporting
by adopting the General Systems Theory**

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Enhancing the materiality principle in Integrated Reporting by adopting the General Systems Theory

ABSTRACT

This paper aims to explore the effectiveness of the materiality principle within Integrated Reporting (IR) by applying the General Systems Theory (GST) of Ludwig von Bertalanffy. This study uses the GST to identify which the main sub-systems are composing the whole regulation of IR and the relationships among themselves, functional to make the materiality principle effective. Our analysis demonstrates that materiality is not a stand-alone principle but needs to be supported by other principles to be enacted, and the lack of other principles can affect the effectiveness of the materiality principle. In particular, our approach on materiality needs a broader vision, not based only on investors, but including all stakeholders. Findings can be helpful for standard setters and professional bodies to define a better regulation of the materiality principle within IR. This provides a framework for an alternative thought process for simplification without sacrificing proper breadth of stakeholder-focus.

Keywords: materiality, Integrated Reporting, sub-systems, stakeholders, framework, General Systems Theory

1. Introduction

Materiality is an evolving concept that “has historical dimensions, shaped by different, at times conflicting, expertises” (Edgley, 2014, p. 256). In particular, until recently, there were two major streams of application represented by financial and non-financial reporting (e.g., Stolowy and Paugam, 2018). The introduction of IR (IIRC, 2013c), with its multidimensionality, has generated a sort of combination of both (de Villiers et al., 2014; Stubbs and Higgins, 2014, Adams, 2015) by embedding integrated thinking into corporate reporting. Such a situation implies a probably new and different approach to materiality, and a major complexity since the IR Framework explicitly considers six types of capital (IIRC, 2013a; IIRC, 2013b, IIRC, 2021a). This is the reason why it requires a major investigation, after a careful analysis and comparison of the previous two separate approaches.

Applied ultimately to the IIRC context, the paper aims to stress that the IR approach may represent the optimal reporting model for investigating and checking the materiality determination process (IIRC, 2013a; 2021a). Given that the materiality concept can support both financial and non-financial reporting issues (Lai et al., 2017) the multi-capital framework can provide an interesting categorization of capitals for selecting and prioritizing various material matters that can affect the value creation process (IIRC, 2013a; 2021a). In more detail, by considering the claimed integrated approach on financial and non-financial issues by IIRC (Arul et al., 2020), we adopt the General

Systems Theory (GST) by Ludwig von Bertalanffy (LvB) to enhance the materiality principle, identifying interplays and relations between the forces able to enact the materiality principle and to achieve its objectives. This paper, to our knowledge, is the first adopting this point of view to address this specific issue. In this way, we introduce the concept of open systems by focusing on relationships among elements and parts of the system. On the basis of the GST structure, we assess how the materiality principle can be embedded into the Integrated Reporting (IR) Framework.

Our contribution is threefold. Firstly, our study can contribute to understand the functioning of the materiality principle by adopting the GST of LvB. This analysis demonstrates that the materiality principle can concretely exist only through interactions with other principles and concepts. Second, this study considers how materiality has been tackled by the IR approach, finding out some incongruities and useful insights for the IIRC and for the other standard setters in realizing their guidance, for entities that have already started publishing their IR, and for users in better understanding it. Third, since this analysis is realized with a normative and critical approach (Horkheimer, 1993), our results can generate both theoretical implications going in depth in the analysis of the principle, its understanding and the relationships with other principles affecting its concrete applicability. This approach meets the three criteria of critical theory: it is explanatory, practical and normative at the same time (Horkheimer, 1972; 1993). Our findings can be helpful for defining a better regulation of the materiality principle within the IR Framework, and within other financial and non-financial reporting standards.

The remainder of the paper is structured as follows: Section 2 contains an introduction to the materiality principle and its evolution within literature and main standard-setter documents; Section 3 analyses the theoretical framework based on the GST whereas our methodology is described in Section 4. Section 5 highlights the interpretation of the materiality principle in the light of all previous contributions and specifically with reference to the IIRC's approach. Finally, Section 6 suggests conclusions.

2. A selective literature review

a) Background of the concept of materiality

Corporate reporting costs money and seeks to provide information which is useful to readers. Such readers need to receive information which has the potential to influence their actions or perceptions, in a manner such that the likely benefit exceeds the likely effort. In recent years, there has been a big increase in the production of external reports of different natures, addressing in particular financial, social, environmental and intangible aspects (e.g., Kolk, 2008; Eccles and Krzus, 2010; Camilleri, 2015; KPMG, 2019). Such documents tend to present much information, in some cases overlapping among themselves (Plumlee, 2003). Reports are becoming more and more time-consuming for preparers and for users (IIRC, 2017; Melloni et al., 2017). A necessary condition for a positive net outcome from the trade-offs inherent in the above considerations is that the information is material. Prefiguring the more rigorous analysis below, we can roughly explain this concept as requiring that the user concerned is in a better position with the information than without it.

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3 This very broad statement needs to be applied in a context-specific and user-specific scenario. In
4 other words, whether a specific user at a specific time, in a specific place, with a specific
5 stakeholder-type relationship (implying specific relevant 'actions or perceptions') with the reporting
6 entity, with specific interpretative (in)abilities, will find information 'material' is a question of fact.

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8 In more detail, the 'materiality principle' should have two main objectives: on the one hand to
9 select information when there is too much available to be reported and, on the other hand, to define
10 a parameter useful to allow auditors (or assurance providers) to certify the report. The first category
11 is based on the indefinite possible amount of information that could be supplied to the users in cases
12 where they are not specifically determined (by the law for instance). The second category is
13 functional to define a sort of significance margin useful to allow auditors and assurers to do their
14 job in estimating or evaluating the validity of figures and information. Brennan and Gray, (2005, p.
15 4) note that "definitions of materiality are important to three groups of stakeholders: preparers...,
16 auditors [assurance providers] and users...". Even if "decisions are made by only two of these three
17 groups, preparers and auditors, ... judgments of users of financial statements are central to the
18 definition, not judgements of preparers (even though it is preparers who make the judgments)". The
19 same authors also add that "the concept of materiality (in effect) builds flexibility into financial
20 reporting. This can lead to abuse" (2005, p. 3).

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22 To achieve these objectives, international literature has begun to analyse materiality to find useful
23 definitions of the concept and suitable operating processes, in particular considering the materiality
24 principle and its application in different contexts, in particular financial reporting, auditing
25 behaviour and assurance providers' behaviour, and non-financial reporting.

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27 With reference to *financial reporting*, in 1933 a *material fact* was defined as "a fact the untrue
28 statement or omission of which would be likely to impact the conduct of a reasonable man with
29 reference to the acquisition, holding or disposal of the security in question" (Gordon, 1933). This
30 definition is more or less still adopted also nowadays within the scope of financial reporting. Other
31 authors supply useful insights to understand how the principle works, its role among the other
32 principles and what could be the process to apply materiality in operational terms. Boatsman and
33 Robertson, (1974, p. 342) suggest that: "In general, the process of formulating materiality
34 judgments has been regarded a priori as user-oriented. Hence the ultimate subjective test applied in
35 the determination of whether or not an item of financial information is material has been the
36 criterion of whether its disclosure would likely affect the decision of an information user". The
37 FASB Discussion Memorandum, Criteria for Determining Materiality (1975) acknowledged the
38 relevance of this principle. Heitzman, Wasley and Zimmerman (2010, p. 111) state that "The
39 materiality concept, which predates the U.S. Securities Acts, pervades legal doctrines, securities and
40 trading regulation and financial reporting practices (i.e., GAAP). [...]. Materiality defines the
41 threshold between the important and the trivial. [...]. Both the Financial Accounting Standards
42 Board (FASB) in Statement of Financial Accounting Concepts (SFAC) # 2 and the SEC in Staff
43 Accounting Bulletin (SAB) 99 clarify that materiality is context specific".

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45 With reference to the *auditing aspects*, the UK Auditing Practices Board (1995a, paragraph 8) gives
46 prominence to this principle stating that "an audit ... is designed to provide reasonable assurance
47 that the financial statements taken as a whole are free from material misstatement". This is a typical
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3 approach of accounting standard setters, who define rules finalized to avoid material misstatements
4 and omissions, as we will see later in the paper. In the same direction, Cooper and Owen (2007)
5 state that “... The materiality principle requires the assurance provider to state whether the reporting
6 organisation has included in its report information required by stakeholders to enable them to make
7 informed judgements, decisions and actions [...]”. With reference to the impact of materiality on
8 audit practice, useful contributions addressing different specific issues include Lee (1984),
9 Carpenter *et al.* (1994) and Blokdijk *et al.* (2003).

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11 Edgley *et al.*, (2015) draw attention to the different approaches followed by auditors and assurance
12 providers by stating that “Although a stakeholder logic is likely to be common amongst all assurors
13 (because SER [social and environmental reporting] operates for a stakeholder audience), we
14 anticipate that points of divergence in logics are likely to be observed between these assuror groups.
15 Hybrid-logics may be evolving” (Edgley *et al.*, 2015, p. 2). The importance of considering
16 materiality within the audit of non-financial information has been underlined by Messier, Martinov-
17 Bennie and Eilifsen (2005). Many other contributions address the requirements necessary to make
18 the assurance process work (e.g., Wallage, 2000, O’Dwyer and Owen, 2005). These studies contain
19 examples and characteristics of criteria to evaluate how management assertions regarding
20 sustainability are described. They also contain some verification procedures that can be adopted for
21 the assurance process.

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23 With reference to *non-financial reports*, some useful contributions arise from Eccles *et al.* (2012)
24 who underline the need for a sector-specific materiality definition for sustainability reporting
25 standards. In the context of non-financial reporting Mio and Fasan, (2014) note that the definition
26 of materiality implies some practical difficulties, mainly due to the lack of quantitative thresholds as
27 compared with financial materiality, and the presence of a wider and more heterogeneous array of
28 nonfinancial reporting users. Some recent contributions more focused on IR consider the problem of
29 materiality. Stubbs and Higgins (2014, p. 1083) investigate internal mechanisms and find that all
30 the organisations in the study have a process to identify material issues, “but the integrated reporters
31 are changing their materiality process. The organisations issuing integrated reports are attempting to
32 align the materiality process with the business strategy and some expressed the desire to move away
33 from sustainability reporting guidelines that have a “one size fits all” approach. Integrated reporters
34 point to focusing on fewer, more strategic issues rather than lots of issues that are, for example,
35 covered by the GRI¹”.

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37 Brown and Dillard (2014, p. 1121), quoting the Trade Union Representatives (2011), put in light an
38 important aspect: “We do not agree that the initial focus should be on the reporting needs of
39 “investors” (i.e., shareholders). [...] It is essential from the outset that the design process adheres to
40 the principle of materiality and meets the needs of the full range of internal and external
41 stakeholders. Otherwise, there is a risk of designing into the IR Framework a lasting bias towards
42 the needs and priorities of shareholders at the expense of other stakeholders”. More recent support
43 for the thinking behind this comment is rigorously presented in Alexander and Blum (2016), who
44 maintain that IIRC has sacrificed its original (if idealistic) broadly-based accountability desires on
45 the altar of measurement in general, and financially quantifiable measurement in particular.

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¹ Global Reporting Initiative, www.globalreporting.org.

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3 In addition to the previous contributions, practitioners have started several discussions on what is
4 effectively important and material in sustainability disclosure are increasingly attracting academic
5 interest in the materiality analysis process (Farroq and de Villiers, 2019), stimulating empirical
6 studies (saenz, 2019; Machado et al., 2020) and reflections about the nature of the materiality
7 assessment. For example, Puroila and Mäkelä (2019) argue that “Materiality assessment itself is
8 valuable as an inclusive practice. Reporting of the issues prioritised, [...] broader stakeholder
9 accountability and the pluralistic accounts of sustainable development are crucial if we wish to
10 develop a societal-level transition towards sustainability”. In this perspective, Dialogic Accounting
11 (DA) can serve as a conceptual framework to emphasize the agonistic-democratic approach and the
12 engagement processes (Bebbington et al., 2007; Manetti, 2011; Passetti *et al.*, 2019) in defining
13 materiality issues of corporate reporting. In this way, it is possible to highlight the conflicting
14 opinions of stakeholder representatives that influence the materiality assessment leading to a more
15 dialogic, inclusive and democratic accounting (Bellucci et al., 2019; Puroila and Mäkelä, 2019;
16 Cerbone and Maroun, 2020).

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18 Other useful insights arise from an analysis of the documents issued by various standard setters and
19 professional bodies. They consider the materiality principle with the purpose to define guidance for
20 its application within practical situations, stating specific rules for each report.

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22 With reference to standard setters and professional bodies, their position with reference to
23 materiality can be summarized as follows.

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32 *Table 1: Overview on “materiality” by some regulators*

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37 It is apparent from this literature review (itself partial) that many different nuances can be found,
38 leading to difficulties of comparison and a lack of a universal conception. It emerges that one of the
39 main problems is that decisions about the information to supply in the reports are made by preparers
40 and auditors, whereas the judgement of users of financial statements is central to the definition (not
41 the judgements of preparers who in practice have to make the decisions). Such judgements may be
42 particularly difficult in the context of non-financial information (Green and Cheng, 2019). It also
43 emerges that literature has not analysed the interactions of the materiality principle, with other
44 principles and rules, to be effective. In this area we collocate our contribution.

45 46 47 48 49 *b) Integrated Reporting*

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51 This paper addresses the materiality principle in the context of a major topical extension to
52 corporate reporting into the area of sustainability and IR, i.e., the IR Project, that claimed to include
53 in a unique report all useful information (Eccles and Krzus, 2010). However, from the original idea
54 – to be the “one report”, and focus on sustainability and stakeholder approach - the IR project
55 shifted to a completely different reporting model (Flower, 2015; Alexander et al., 2015; Alexander
56 and Blum, 2016) becoming an additional report addressing the value creation process in the ‘short,
57 medium and long term’ and analysing, in a concise way, material aspects influencing it.
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As the basis for our exposition and analysis, the formal IIRC position, as only very recently updated and confirmed in the 2021 Framework revision, needs to be established.

“An integrated report (IIRC, 2021 paras. 2.2 and 2.3) [...] aims to provide insight about:

- The external environment that affects an organization.
- The resources and the relationships used and affected by the organization, which are referred to collectively in the <IR> Framework as the capitals and are categorized in Section 2C as financial, manufactured, intellectual, human, social and relationship, and natural.
- How the organization interacts with the external environment and the capitals to create, preserve or erode value over the short, medium and long term.”

The IIRC Framework defines the primary stakeholder very precisely. What are the priorities and relationships between these six very different capitals? The simplistic ‘upfront’ answer to this question from the IIRC is absolutely clearly stated in para 1.7: “The primary purpose of an integrated report is to explain to providers of financial capital how an organization creates, preserves or erodes value over time. It therefore contains relevant information, both financial and other.” So, the key stakeholder of the report is represented by the providers of financial capital, defined in the Glossary as: “Equity and debtholders and others who provide financial capital, both existing and potential, including lenders and other creditors. This includes the ultimate beneficiaries of investments, collective asset owners, and asset or fund managers.” It is worth noting the similarity of wording with the IASB Framework para 1.5 referring to information that is useful to “existing and potential investors, lenders and other creditors...”. The key customer of the IIRC is identical to the key customer of the IASB. Any focus on the other five capitals, surely central to considerations of social, environmental, or sustainability appraisal and reporting, has been deleted.

To emphasise this point, the Framework underlines that the focus is on “how an organization creates, preserves or erodes value over time”. But it is not clear for whom the value is. Presumably (following paragraph 1.7 quoted above), the value is for the suppliers of finance.

To summarise, as now established, an IIRC IR is addressed to providers of financial capital as main users. Even if it is assumed that investors can represent all stakeholders (being stakeholders themselves), their perspective is likely to be very different from the other stakeholders. One relevant case is the preservation of the environment that for investors has to be seen only in the value creation process context (presumably mainly related to risks) whereas for other stakeholders may become crucial and central. Due to the increased complexity (embracing all six ‘capitals’), ‘materiality’ has become one of the more important issues related to the IR project (Green and Cheng, 2019).

c) *Integrated Reporting and materiality*

The implications of subsections a) and b) above, taken together, are that EITHER the complexity is enormously increased because it requires a 6-dimensions optimisation and reporting problem, OR that IR risks to become effectively meaningless as it reduces to financial considerations focused on the entity (and its suppliers of capital), and not on the whole stakeholders, and in particular not on the ones interested in the environment, notwithstanding their importance (Brown and Dillard, 2014). Much more available information, relevant to many more types of users, and increasingly

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3 diverse in characteristic and philosophy, comes to the fore. Only the really important, significant,
4 and therefore material, information for the target stakeholders should be provided. But this
5 statement is easy, and as it stands meaningless unless we define and agree on the target stakeholders
6 and their needs.
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8 The IR Framework points out in paragraph 3.20: “To be most effective, the materiality
9 determination process is integrated into the organization’s management processes and includes
10 regular engagement with providers of financial capital and others to ensure the integrated report
11 meets its primary purpose”. Judgement is needed (para 3.29), to “ensure the integrated report meets
12 its primary purpose as noted in paragraph 1.7 (i.e., to meet the needs of suppliers of capital)”.
13 Crucial to this process is the “reporting boundary”. The glossary gives this definition: the
14 “boundary within which matters are considered relevant for inclusion in an organization’s
15 integrated report.” Figure 3 of the new CF suggests a wide range of relevant considerations/parties,
16 but it also very much emphasises the focus on the financial, so the Framework emphasises the need
17 for strong materiality considerations.
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19 Further factors to consider are ‘conciseness’ (para 3.36 and following), reliability (para 3.40 and
20 following), ‘balance’ (3.44 and following), ‘completeness’ (para 3.47 and following, including
21 cost/benefit considerations para 3.49), and consistency and comparability (para 3.54 and following).
22 These brief quotations can be considered vague in the extreme, perhaps necessarily so given the
23 inevitably judgemental and context-specific nature of the process, but on the other hand firmly
24 pointed towards the financial and ‘value’-laden implications of the organisation’s activities and its
25 interactions with the world beyond its borders. In summary, the declared focus of ‘IR’, despite
26 various diversionary proposals (not presented in detail here) relating to a wider concept of
27 stakeholders, returns largely to a focus on information of relevance to providers of finance, and the
28 objective of adding value, gradually abandoning the earlier wider and multidimensional stakeholder
29 approach (IIRC, 2013a). As argued by both Flower (2015) and Alexander and Blum (2016), the
30 original focus on sustainability of the earliest (2010) documents has been sacrificed on the “altar of
31 measurable, quantifiable and financial metrics”. The implications of materiality which arise have
32 tended to focus correspondingly.
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34 From all this discussion, it emerges that it is important to understand the materiality principle in its
35 multidimensional and cross-functional approach, also with reference to the interrelations with other
36 principles.
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38 39 40 41 42 43 44 45 46 47 48 49 **3. Theoretical Framework**

50 51 52 *The General System Theory (GST): background and fundamentals*

53 We rely in our study on the theories by Ludwig von Bertalanffy², (LvB) who is considered one of
54 the first masterminds of the “general system theory” (GST). His early works in this field, mainly
55 written in the German language, have been collected in the book General System Theory.
56 Foundations, Development, Applications (1968). As the author specifies in “The History and Status
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² LvB participated to the Vienna Circle, a group of philosophers and scientist, chaired by Moritz Schlick, and proposing the logical positivism later called logical empiricism.

of General System Theory”, the origin of his vision can find its roots in Aristotle’s statement: “The whole is more than the sum of its parts” (LvB, 1972, p. 407). This sentence is considered by LvB as still valid, and it represents a definition ‘of the basic system problem’. For LvB, the theory of systems represents “a new paradigm”, in the sense of Thomas Kuhn, contrasting to the predominant, elementaristic approach and conceptions” (LvB, 1972, p. 415), since science previously adopted the second maxim of Descartes’ *Discours de la Méthode* consisting in breaking down every problem into as many separate simple elements as might be possible. This, similarly formulated by Galileo as the ‘resolutive method’, was the conceptual “paradigm of science from its foundation to modern laboratory work: that is, to resolve and reduce complex phenomena into elementary parts and processes” (LvB, 1972, pp. 408-409). Another source of ideas for LvB was represented by the Gestalt theory, within the psychology field of studies, that “posed the question that psychological wholes (e.g., perceived Gestalten) are not resolvable into elementary units as punctual sensations and excitations in the retina” (LvB, 1972, p. 410). All these aspects lead to shift the analysis from the singular elements, to the processes and coordination of such elementary parts. This way of thinking was gradually expanded from the field of biology, to other wider fields, so that “the term “organism” [...], is replaced by other “organized entities”, such as social groups, personality, or technological devices. This is the program of systems theory” (LvB, 1972, p. 410). In other words, “in order to understand an organized whole we must know both the parts and the relations between them” (LvB, 1972, p. 411). LvB (1972, p. 415) developed a “dynamical” system theory by using mathematical descriptions of systems properties (such as wholeness, sum, growth, competition, allometry, mechanization, centralization, finality, and equifinality), and focusing on the interplay and interactions of different elements (see the case of the “interplay of enzymes in a cell, the interactions of many conscious and unconscious processes in the personality, the structure and dynamics of social systems, and so forth”).

GST and its potential application in social fields

The Society for General Systems Research was founded to formulate a program (1954) that remains valid as a research program in GST: “Major functions are to: (1) investigate the isomorphy of concepts, laws, and models in various fields, and to help in useful transfers from one field to another; (2) encourage the development of adequate theoretical models in the fields which lack them; (3) minimize the duplication of theoretical effort in different fields; (4) promote the unity of science through improving communication among specialities” (LvB, 1972, p. 413).

In this way, the GST has become applicable to social matters. At a theoretical level, within the world, we can find some sort of “separated units”, smaller and with a reduced complexity. These are the social systems, whose degree of complexity changes based on the development and the capacity of selecting and to structurally organize the systems themselves. Since social systems are realized based on common sense, the analysis of communicative processes is essential within social research. Social reality, if it is not based on natural reality, is anyway one of the many faces of a unique reality that, as such (or in itself), can be observed and understood with a unique corpus of conceptual tools. Physics, biology, philosophy, art and sociology all being products of the human

mind, it is rational to think that, at least with a certain level of abstraction, the same conceptual tools can be used in all such fields of study (Ruzzeddu, 2012, pp. 12-13).

In general, GST has created a new way of considering the object of study, introducing open systems and focusing on relationships among elements and parts of the system. Making reference to concepts arising from biology, LvB specified that a system is open when it makes exchanges with agents different from itself (Boulding, 1956). Many of the relationships valid within natural sciences, can be applied also by social sciences and be useful for inquiring the object of study. Since the main characteristic of living beings is their organization, the study of the singular parts or processes cannot supply an exhaustive explanation of natural phenomena (LvB, 1934, p. 64) and it is important to define the rules that regulate these systems. This way of investigating has been called 'theory of organisms' (LvB, 1934, pp. 64 and following). A system is a complex reality whose elements mutually interplay based on a circular model in which each element affects the others and itself is affected. As a consequence, the meaning of each element cannot be considered by the elements themselves, but rather in the system of relations in which it is collocated. GST considers that the system derives from a selecting process made by the observer, who, based on his own scientific interests, chooses to consider some elements and to exclude others. The system, in this way, should not be considered as something objectively existing within reality but rather as a subjective theoretical elaboration aimed at analysing specific phenomena.

Further developments of GST

Boulding (1956) has contributed to developing the application of the GST by creating a corollary, considering systems as a sort of matryoshka (like the Russian nesting dolls), in which each level maintains the characteristic of the previous one, and extends them. By this way he opened to the analysis of subsystems in which the system is articulated, considering this approach helpful to understand analysed phenomena (Hatch, 1997; Fraticelli, 2011, p. 14). Pondy and Mitroff (1979), analysing open systems, propose this classification based on nine levels, each of them characterized by an increasing level of complexity: Level 1, Frameworks; Level 2, Clockworks; Level 3, Control Systems; Level 4, Open systems; Level 5, Blueprinted growth systems; Level 6, Internal Image systems; Level 7, Symbol processing systems; Level 8, Multi-cephalous systems; Level 9, Systems of unspecified complexity. In particular, Level 3, Control systems, is defined as follows: "Control system models describe regulation of system behaviour according to an externally prescribed target or criterion, as in heat-seeking missiles, thermostats, economic cycles in centrally formations and differentiated structures, and also the phenomenon of mitosis-duplication through cell division" (Pondy and Mitroff, 1979, pp. 6-7). As stated by Scott (1992, pp. 106-107), theoretical models generally stop their analysis at the fourth level. In the case of our analysis, the level more fitting with this classification is the third one listed above. In this way LvB has enlarged the scientific field of application of his theory, open to systems thinking.

GST and social/economic fields

After a period of wide diffusion during the decades until '80s, LvB's theory has found an application even in more recent periods, in the accountability fields (Gray, et al., 1996; Gray et al.,

2014; Alexander and Blum, 2016). In the same view a special issue was published in the journal “Systems Research and Behavioral Science”, titled “Ludwig von Bertalanffy and his enduring relevance: Celebrating 50 years General System Theory” (Van Assche et al., 2019), collecting some relevant contributions, mainly related to sociological fields of studies. The ‘Guest Editorial’ specifies that LvB’s “theory of open systems can still contribute to a myriad of disciplines and, importantly, to discussions crossing disciplinary lines. [...] While the difference between these systems has never been disputed by him, the guiding concepts of his GST were sufficiently abstract and designed to make comparison possible so that they could easily transcend the boundaries of different types of systems and the disciplines studying them. The relationship between the ideas of systemic openness and closure, for instance, has been a central concern in the work of diverse system theorists such as Francisco Varela, Gregory Bateson, or Niklas Luhmann” (Van Assche et al., 2019, p. 251). “While his ideas reached fruition in the fields of psychology and psychiatry, his conceptualization of the social world is woefully underdeveloped, so the linkages between individual, society, and encompassing social-ecological systems remain weakly understood as well. As several authors in this issue argue, von Bertalanffy did provide foundations for a development of social theory, which could adequately link individual, group, and environment in a way called for by the early systems theory. While von Bertalanffy’s GST never presented a fully developed theory of social systems, Vanderstraeten (2019), Hofkirchner (2019), and Cadenas (2019) argue that the insights from Bertalanffyian GST still have relevance for the social sciences” (Van Assche et al., 2019, p. 252). In particular, Hofkirchner (2019) provides an interesting interpretation of GST by positioning social relations in the hierarchy of processes internal to a social system and contributing to three levels of knowledge, i.e., methodology, theory and technology. Furthermore, Valentinov *et al.* (2019) point out the parallels between the concepts of openness and transparency, which is often touted today as an element of good governance. Moreover, GST can offer theoretical fundamentals for the current social science. Moving to sustainability-oriented fields we can note that GST has been used to validate an eco-systemic framework by considering how a sustainable business can operate itself “as a complex system similar to a living organism” (Sun et al., 2017, p. 2). Moreover, market-focused sustainability adopts GST to integrate customers (and other stakeholders) into marketing strategies (Hult, 2011). In the accounting /accountability context despite the analysis by Alexander and Blum (2016) that adopts the Luhmann theory for understanding the complex set of systems issued by IIRC, the GST conceptualization has not been applied in the recent development of sustainability accounting. To address this gap the further developments of LvB’s theory can facilitate an in-depth assessment of the interrelationships between materiality principle and other principles, particularly in the complex system reporting of IR.

GST and the IR Framework

As we have previously seen, GST has created a new way of considering the object of study, introducing open systems and focusing on relationships among elements and parts of the system. IR, is a report – based on a system of rules – for its nature addressing the information needs of several stakeholders, being based on financial and non-financial information.

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3 These aspects shift the analysis from the singular elements, to the processes and coordination of
4 such elementary parts (“in order to understand an organized whole we must know both the parts and
5 the relations between them”, LvB, 1972, p. 411), to understand the best way to define the system of
6 rules that can regulate the reporting activity. This activity is obviously not free from biases since, as
7 evidenced in the previous analysis of the GST, the “selecting process made by the observer, who,
8 based on his own scientific interests, chooses to consider some elements and to exclude others. The
9 system, in this way, should not be considered as something objectively existing within reality but
10 rather as a subjective theoretical elaboration aimed at analysing specific phenomena”.

16 **4 Methodology**

19 *4.1 The choice of IR as a matter of study*

21 Materiality has been deeply studied, with different angles of analysis (Dumay et al., 2016). Edgley
22 (2014) proposes a wide literature review of the different contributions and from the analysis it
23 emerges that many contributions focus on the audit perspective (e.g., Chewning, Pany, Wheeler,
24 1989; Carpenter, Dirsmith, 1992; Carpenter, Dirsmith, Gupta, 1994; Big Five Audit Materiality
25 Task Force, 1998). Other contributions focus on the meaning/definition of materiality, or on the
26 characteristics of materiality (e.g., Bernstein, 1967; FASB, 1975; Estes and Reames, 1988; Bean,
27 Thomas, 1990; Blakemore and Pain, 1998; Fang and Jacobs, 2000; Chewning and Higgs, 2002;
28 Brennan and Gray, 2005; Dale, 2005; Davidoff, 2011; ESMA, 2011, 2012), or on the judgements
29 required to apply materiality (e.g., Firth, 1979). Our paper distinguishes from previous analysis
30 since it addresses the standard setter perspective, which should adopt a holistic approach since it
31 pursues the best equilibrium in the regulation of each kind of reporting system.

32 IR, if approached broadly and flexibly as originally envisaged (Eccles and Krzus, 2010; IRC of
33 South Africa, 2011; IIRC 2011, 2012a, 2012b), and not through the narrow finance/investor focus
34 of much recent requirement and practice (IIRC 2013, 2021), will combine financial and non-
35 financial information, and can be considered as one of the most complex and holistic reporting
36 systems.

44 *4.2 The choice of GST and its application in this research*

45 Since the GST, to our knowledge, has never been applied to accounting standards or standards
46 issued by other professional bodies, there is no previous interpretation of how the systems vision
47 can be applied to them. This research tries to find a possible way to apply the theory of the system
48 to a complex body of coordinated ‘rules’ such as the ones that should govern reporting. We will
49 apply this schema of analysis to the IIRC Framework in its latest issued version (2021), this being
50 the potentially most wide-ranging and complex regulatory framework to consider. To achieve this
51 result, we consider the interconnections between the different elements and the roles played by each
52 one, comparing them with the human body. In particular GST is here used to identify which are the
53 main sub-systems composing the whole system of underlying the IR and the functional
54 relationships among themselves as it happens with reference to the human body. This aspect is
55 relevant for the understanding of the strengths and weaknesses of the current regulation proposed by
56 the IIRC.

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3 Applying von Bertalanffy's theorization of organizing relations, we demonstrate that the materiality
4 principle cannot be considered as an autonomous element, but it represents a subsystem of the
5 corporate reporting system and that only by analysing interplays with other subsystems can we
6 verify its effectiveness. It represents one of the aspects of a holistic system of principles and
7 concepts that reinforce themselves and, *inter alia*, allow the concrete and effective working of the
8 materiality principle. This analysis is conducted adopting a deductive approach and can help in
9 defining the elements currently missing within the IR Framework from a holistic perspective.
10 Additionally, our methodological approach can be linked with the notion of theory as narrative by
11 DiMaggio (1995). Our analysis uses this kind of theory that ranges from investigating exploratory
12 hypotheses by identifying "regularities in relations among variables together with plausible
13 accounts of how action could produce the associations observed, to formally modelled principles
14 predicting distributions of outcomes" (Ahrens and Dent, 1998, p. 12).

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20 Our methodological approach is structured as follows. The first step is to verify if reporting
21 standards (such as IASB standards, CSR standards, IR standards), can be considered as an open
22 system. They represent the rules and guidelines for entities to report about specific aspects of their
23 social and economic life. By doing this, they involve different subjects like the adopters of the
24 standards, their consultants, the users of the information supplied, represented by investors and
25 other stakeholders, the audit and assurance companies granting the reliability of information, the
26 states for tax and compliance reasons, the financial market, in particular for listed companies. As we
27 can see there are many open and dynamic relationships that can induce to fully consider the
28 different sets of reporting standards as open systems. This represents an important aspect, because
29 till now, GST has been applied to organizations and not explicitly to reporting standards. But such
30 application can lead to a deeper and more structured analysis of the relations among the different
31 rules and requirements included in these corpora of standards. Based on Boulding (1956) we can
32 divide the corpus of rules into subsystems to allow a deeper comprehension of the functioning of
33 each subpart. Such division into subsystems is an intellectual activity that means a construction of
34 the intellect aimed at clarifying the ways in which the whole system can survive and try to achieve
35 its goal. As an intellectual activity, it can be improved by further researches. Materiality is generally
36 seen as an element of the principles system of the corporate reporting. By adopting LvB's theory
37 this paper considers materiality as an element of the reporting activity, that needs to interact with
38 other elements and principles to be effective, in the same way, for example, that heart, veins and
39 arteries constitute the circulatory system, that is itself a sub-system of the human body. This has
40 been realized, analysing and underlying interplays and relations of the materiality principle, with
41 other principles, standards and other elements composing this context. Standard setters, in fact,
42 generally devote a specific standard to materiality, so that materiality becomes an autonomous
43 element (sub-system) of their reporting and accountability system. However, we demonstrate that
44 materiality does not represent a stand-alone principle, but requires integration with other principles
45 to achieve its objectives. To do this, we refer to the original approach of LvB that sees in the natural
46 sciences the prototype of analysis that can be applied and extended to other sciences, included
47 social science. Creating a conceptual bridge with the human organism, we can consider, as a
48 simplified example, the circulatory system. Its *general purpose* is to maintain the health and the
49 survival of the human organism. The *specific purpose* is to allow blood to circulate and transport
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3 nutrients, oxygen and other elements to organs and cells, fight diseases, etc., and to convey toxins
4 and other negative substances to be eliminated towards the organs responsible for this function. To
5 achieve all these different objects, the subsystem of the ‘circulatory system’ creates interrelations
6 with other subsystems, for example the respiratory system, the digestive system, and the urinary
7 system. With these systems, there is a sort of bidirectional relationship, whereas with other
8 subsystems, as for example the visual system, or the auditory system, the relationship is less
9 stringent, since the circulatory system does not need them to be effective. ***Assumptions and***
10 ***functioning instruments*** are represented by a functioning heart, lungs able to bring oxygen and able
11 to exchange other elements; depurative organs able to clean the body from toxins and specific
12 wastes and convey them to the blood, when required. ***Elements that preserve and maintain the***
13 ***integrity*** of the arteries and veins, are for example a low level of cholesterol, the right number of red
14 blood cells, etc.

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20 By using this classification as our methodological framework, we verify how the different reporting
21 rules of the IR Framework can fit with this classification and if there are some omissions that can
22 prevent the system, and in particular the subsystem of materiality, from working in the correct way,
23 and achieving its aims. Finally, after finding the main critical aspects and omissions in the IR
24 regulation, in a way to find possible useful solutions, we consider if the regulation proposed by
25 other standard setters, in particular addressing non-financial information (NFI), such as (GRI,
26 withing GRI 4 regulation and, AccountAbility within AA1000) contains possible useful solutions.
27 To ensure the quality of these findings and the rigour of the research design this study fits the main
28 gold-criteria of qualitative analysis, i.e., credibility, transferability, dependability, confirmability
29 and reflexivity (Lincoln and Guba, 1985; Korstjens and Moser, 2018). Firstly, the credibility of this
30 analysis can be ensured by identifying the most relevant characteristics and elements for the
31 materiality principle on which this study focuses. In terms of transferability, we can argue that these
32 findings take into account not just literature and theories but their context as well, as we introduce
33 an innovative approach by linking GST and the IR complex system of financial and non-financial
34 reporting. By this way our evidence can become meaningful for academics and practitioners, by
35 offering different further interpretations of this approach. Dependability and confirmability are not
36 applicable in this study as we have not collected data from interviewees or surveys. Finally,
37 reflexivity emerges from this analysis as preconceptions, assumptions and a certain degree of
38 subjectivity represent a limitation of this research. This aspect does not allow the generalizability of
39 our evidences that often is considered an unnecessary goal in qualitative research (Carminati, 2018).

40 41 42 43 44 45 46 47 48 49 **5. Analysis and discussion**

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51 From our previous considerations, it emerges that we need to contextualize the materiality principle
52 within the logics of the system it belongs to (Cerbone and Maroun, 2020), but previous literature
53 mainly uses institutional logics by focusing on conflicting relations among stakeholders to improve
54 the assessment process of the materiality principle (Bellucci et al., 2019; Puroila and Mäkelä, 2019;
55 Cerbone and Maroun, 2020). This theoretical framework is not able to provide an effective
56 explanation of how the materiality principle can effectively operate within the complex system of
57 IR, following the supreme principle of the organization of any system, i.e., “unity through
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diversity” (Hofchirkner, 2019). To address this gap, we select the rationale of GST to analyse the main elements of the ‘IR system’ by considering IR as a coordinated system functional to supply information to stakeholders, and trying to define the main relationships and interplays among such different elements. This methodological approach can be applied to the analysis of the materiality principle. This represents an innovation since standard setters and professional bodies generally adopt a hierarchical classification of the stated principles, without underlining the relationships among them. The theory of systems forces us to include other analyses, not only based on a vertical approach, defining the interrelationships among the different elements of the system (“integration”). Following on from all this material, based on GST and its theoretical evolution, we define the interrelationships among the different elements, trying to group them in homogeneous families that can represent subsystems (or levels) of the reporting system useful to understand how the materiality principle works in its context of rules included within the IR Framework. With reference to the *general purpose* of the reporting system, we can say that it is represented by the ability to survive over years as a form of reporting. This is consistent with human bodies.

With reference to this aspect, we can find families of principles mainly addressing the whole system of the IR information. We can call them *Principles underlying the IR structure*, as reported in Table 2 below. With reference to the *specific purpose* of the materiality principle, we can consider that it aims to safeguard the interests of users and preparers. For the first ones it is a matter of time. The report should supply useful information without requiring the reader to spend too much time. With reference to the preparer, it is a matter of savings, since producing information is costly. Combining the two elements, we can say that it is a matter of costs/benefits.

Table 2. Principles underlying the IR structure

With a specific focus on the sub-system of materiality, we can try to understand and classify the relationships and *interplays with other subsystems*. In particular, we can observe that the question ‘material to what’ is a sort of basic assumption, and that *usefulness, reliability, conciseness, and cost/benefit approach* represent principles overarching materiality, since, without these requirements, materiality should not be required or necessary. Continuing our analysis, we can find that materiality is strongly related with other principles, in particular, timeliness, completeness, balance between information, reliability, stakeholder engagements and assurability. Even if the relationships are generally circular, we can say that reliability, stakeholder engagement and inclusiveness affect how materiality operates, and they can be considered as overarching principles, or enforcing principles. On the other side timeliness, completeness, and balance between information, are consequences of the dimension given to the materiality principle. Stakeholder engagement and assurability, in particular can be considered as enforcing principles operating, respectively collocated as the first and the last step of each cycle, since they should guarantee the good functioning (application) of the subsystem and of all the system. Finally, elements that can *preserve and maintain the integrity of the subsystem* can be represented by the disclosure of the process of defining materiality.

In doing this, we can define three categories (see Table 3):

- ✓ Principles overarching (or in some ways inspiring) materiality are the *usefulness approach*³, *reliability*, *conciseness* and the *cost/benefit approach*.
- ✓ principles interplaying with materiality are, *completeness*, *timeliness*, *balance between information*⁴.
- ✓ principles that are functional to enforce materiality guaranteeing its right application with reference to the process and to the information supplied are, for example, represented by the *stakeholder engagement* or *inclusiveness* and by *assurability*.

In this perspective, these three categories can be seen as a result of the adoption of the GST to the multidimensional context of the materiality principle as it can be considered as “organizing relations” that merge “substances into systems” (LvB, 1932, p. 81).

Table 3. Principles surrounding the subsystem of materiality

The lack, or weakness, of any one of these elements of the system can affect the ability of the system to achieve its objectives. In this way, the lack of enforcing principles, such as the stakeholder engagement and the assurability, influence the way of adopting the concept of materiality, affecting the reliability of the information reported. This is consistent with the findings of Cerbone and Maroun (2020, p. 1), who find that “Organizations with market, professional and stakeholder logics aligned, have the most sophisticated materiality determination processes”. Stakeholder engagement is in fact a way to enforce materiality.

Given these considerations, we can integrate our analysis by considering how the elements composing the ‘IR system’ can affect the materiality principle. By this way, we can connect aim, theoretical framework (GST) and methodological approach using the main content of the IIRC Framework.

A) *Basic assumptions* (Main users, Material to whom, Focus of the Framework),

B) *Way of operating*, (General or entity specific, Timeliness of the assessment, Limitations, Other aspects)

C) *Related principles*

D) *Other aspects enforcing materiality* (Disclosure of the process).

The first one relates to the **Main Users (material to whom)**. It is stated that the main users of the IR are the providers of capitals. This category represents a new concept within the civil law ‘continental’ reporting tradition, but very close to the ethos of the IASB Framework. In particular one type of ‘capital’, namely the financial capital, is given very explicit priority over any other ‘capitals’ by the IIRC Framework (par. 1,7), as quoted and discussed earlier in the paper. The kind of user can also influence the way of working of the materiality principle within non-financial reporting. With reference to the **Main perspective of analysis (material to what)**, the IR Framework is more focused on preparers’ judgement and not on stakeholders’ needs (GRI) or users’ needs

³ The reference principle generally accepted to allow the application of materiality is the ‘decision usefulness approach’, based on the concept that information has to be useful for the user.

⁴ As we can see later, within the IR Framework is specified there could be an iterative process in determining the information to supply, and balancing materiality and conciseness.

(AA1000). This approach is in some ways closer to the IASB Framework that is more focused on the management of the entity and involves a great freedom for the preparers of the report and reduces the importance of, and the judgement concerning the needs of, the users. Referring to the **Focus** of the Framework, we can find that materiality is influenced by the value creation process which involves identifying relevant matters based on their ability to affect value creation. This represents a major limitation in the application of the principle. The materiality principle is not, according to the IIRC's own framework, related to each issue within the report, (e.g., environmental, financial, etc.), but only to these aspects affecting the value creation process. Indeed, the new CF contains a definition in its glossary, as follows. "Material/materiality. A matter is material if it could substantively affect the organization's ability to create value in the short, medium or long term." Arguably this represents the negation of 'non-financial' reporting. It is as far away from anything to do with sustainability as could possibly be imagined. It strongly distinguishes the IR approach from the other more broadly-based kinds of reports.

The Framework states some basic principles, above analysed, consisting in the Usefulness approach, the Conciseness, the Cost/benefit approach, Completeness, Connectivity, Reliability and Balance between information. IR adopts the **usefulness approach**. Even if usefulness is not considered as a principle, it is anyway recalled in the Framework. Conciseness represents a guiding principle (Section E of the Framework). In the voluntary reports, conciseness is not always considered a basic principle. The Framework adopts a *cost/benefit approach* (paras 3.48, 3.49 and 3.50) and this aspect is in common with the approach of other Standard-setters. The IR Framework devotes section '3F' to 'Reliability and completeness'. **Completeness** means that "an integrated report should include all material matters, both positive and negative in a balanced way and without material error" (Guiding principles p. 5 recalled in par. 3.47). The document also addresses the delicate issue of protecting the competitive advantage of the organization that could be damaged by supplying too much information. **Reliability** has been defined as a faithful representation that can be enhanced by mechanisms such as robust internal control and reporting systems, stakeholder engagement, internal audit or similar functions, and independent, external assurance. Even if all aspects are considered, none of them is compulsory for the IR. The Framework also requires a **balance between information**. It is in fact specified in para 3.38 that "The organization seeks a balance in its integrated report between conciseness and the other Guiding Principles, in particular completeness and comparability". It also supplies some operative suggestions on how to achieve this equilibrium. This aspect does not represent a Guiding principle, but rather an expected consequence of the correct application of the other principles.

With reference to the **perspective to be adopted**, the IR Framework adopts an 'entity specific' approach, or better requires that the approach should be rectified based on the sector specificities. This is typical also of the GRI sustainability report, whereas the IASB adopts a more general approach. Referring to the **timeliness of the assessment**, it emerges that in the final version of the Framework this matter, specifically included in earlier drafts, is no longer recalled. Another important element is represented by the definition of specific **limitations**. Section 1F, paras 1.17 and 1.18 explicitly state that information is not to be reported in cases where "the unavailability of reliable information or specific legal prohibitions results in an inability to disclose material information" and if the "disclosure of material information would cause significant competitive

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3 harm". As seen before, this is a very strong limitation since it excludes many matters that could be
4 relevant for stakeholders, but which do not affect the value creation process. With reference to the
5 **Scope of the materiality principle**, it addresses two kinds of information within the IR, namely
6 financial information and non-financial information (NFI). The principle of materiality does not
7 supply any specific different guideline based on this classification (Mio et al., 2019; Green and
8 Cheng, 2019). Materiality usually has two main dimensions: a qualitative dimension (not always
9 recalled by standard setters – e.g., IASB); and a quantitative dimension that can generate specific
10 thresholds. With reference to the IR Framework, materiality has principally a qualitative dimension
11 that requires an assessment of likelihood of occurrence and magnitude of effects and there are not
12 specified any quantitative thresholds even if many indicators and data contain quantitative
13 information. The Framework adopts an entity-specific approach, but strictly connected with the
14 peculiarities of the sector in which the organization operates to allow the comparison of
15 information⁵. This is a specificity of this Framework and generates a sort of 'rectified entity-specific
16 approach'. **Conciseness** affects materiality. Notwithstanding this circular relationship, within the IR
17 Framework the principle of Materiality is positioned before the one of conciseness (respectively
18 letter D and E of the Guiding principles). By this way conciseness could seem more affected by
19 materiality than *vice versa* ⁶.

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21 We now analyse some missing principles and rules generally recalled by other standard setters or
22 professional bodies, and not considered at all in the final version of the IR Framework. This is the
23 case of **Stakeholders engagement and inclusiveness**, substituted by the completely different
24 concept of '**stakeholder relationships**' addressed in Section 3C, paras 3.10-3.16 ⁷. "Stakeholders
25 provide useful insights about matters that are important to them, including economic, environmental
26 and social issues that also affect the ability of the organization to create value. These insights can
27 assist the organisation to: [...], identify material matters, including risks and opportunities, [...]"
28 "Engagement with stakeholders occurs regularly in the ordinary course of the business (e.g., day-to-
29 day liaison with customers and suppliers or broader ongoing engagement as part of strategic
30 planning and risk assessment). It might also be undertaken for a particular purpose (e.g.,
31 engagement with a local community when planning a factory extension). The more integrated
32 thinking is embedded in the business, the more likely it is that a fuller consideration of key
33 stakeholders' legitimate needs and interests is incorporated as an ordinary part of conducting
34 business". The Framework recalls the engagement with the main users (providers of financial
35 capital) ⁸, but does not supply any specific way to realize this activity, which still remains an
36 exception compared with other standard setters or professional bodies' documents. No more
37 specific engagement is, as a consequence, required to create the IR ⁹. This omission of one of the
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52 ⁵ Par. 3.47, addressing 'Completeness' specifies that "to help ensure that all material information has been identified,
53 consideration is given to what organizations in the same industry are reporting on because certain matters within an
54 industry are likely to be material to all organization in that industry".

55 ⁶ It is anyway specified in par. 3.2 that "judgement is needed in applying [guiding principles], particularly when there is
56 an apparent tension between them (e.g., between conciseness and completeness)".

57 ⁷ 3.11: "It does not mean that an integrated report should attempt to satisfy the information needs of all stakeholders".

58 ⁸ 3.20: "To be most effective, the materiality determination process is integrated into the organization's management
59 processes and includes regular engagement with providers of financial capital and others to ensure the integrated report
60 meets its primary purpose as noted in paragraph 1.7".

⁹ There is no specific engagement with stakeholders. Such users are anyway recalled, e.g., par. 3.22 which specifies that
"An understanding of the perspectives of key stakeholders is critical to identifying relevant matters".

main aspects enforcing the principle of materiality represents a significant difference from the GRI and AccountAbility's documents. The difference with GRI, for instance, lies not only in the subject with which to make the engagement (e.g., the providers of capital for IIRC and a broader concept of stakeholders for GRI), but also in the fact that no information on how to apply the concept is supplied by IIRC, and this represents a great difference with GRI standards. Par. 3.40, anyway, addressing the reliability principle, specifies that it is enhanced by different mechanisms including stakeholder engagement. Compared with the other documents issued by standard setters and professional bodies¹⁰, the *assurability/auditability* matter is not included within the IR Framework. In July 2014 the IIRC launched a public consultation indicated above (*Assurance on <IR> An Introduction to the discussion* and *Assurance on <IR> An Exploration of Issues*) and it released a document entitled "Assurance on <IR>: an introduction to the discussion" (IIRC, 2015). This omission could affect the concrete and valid application of the principle of materiality. We can find a similar approach within the IASB Framework, with the difference that the rules about auditability are generally compulsory for entities and for some aspects out of the scope of the IASB Framework, which just wants to establish accounting rules useful for preparers and also for auditors. This is not the same situation as the IIRC since it addresses, for the moment, a voluntary disclosure. Even if IR contains also (much) financial information, the project refers to assurability and not to auditability. Though a specific draft document has been issued¹¹, no information about assurance is supplied within the IR Framework, and this is more similar to the financial approach (IASB approach), than to the non-financial approach, where it generally represents a pillar of sustainability reports.

Another rule requires the Disclosure of the process of defining materiality. In particular, it requires that the organization should supply (4.42) "a summary of the organization's materiality determination process and key judgements". Par. 3.29 opens up to a sort of free interpretation of the disclosure boundaries, since it states that "Judgement is applied in determining the information to disclose about material matters"¹². The presence of proper disclosures represents an essential element for users to interpret and appraise the materiality process.

Finally we have also to consider that the GST, and the articulation in subsystems, helps to understand that, in line with a more stakeholders-oriented view (see Table n. 1: *Overview on "materiality" by some regulators*), financial information addresses main stakeholders different compared with non-financial information (the source is represented by the different regulatory bodies). This allows to understand that each subsystem (in this case financial and non-financial information) requires a specific process to define materiality, in a way to be consistent with the subsystem needs. In particular, shareholders engagement, is not at all consistent with stakeholders' needs, since in many cases the needs can be opposite. To define only one process to define what is

¹⁰ Even if this principle is more enforcing materiality than depending from it, there is a sort of circular relationship. In fact, to audit or to assure a report it is necessary to define the boundaries of information to assess, but meantime it is important that someone could assess the correct application of the materiality principle.

¹¹ The IIRC issued in 2014 two specific documents addressing the assurance of the IR and in 2015 a summary of feedback on this debate, as discussed earlier in the paper. In addition, the IAS/IFRS Framework does not consider this issue.

¹² "This requires consideration from different perspectives, both internal and external, and is assisted by regular engagement with providers of financial capitals and others to ensure the integrated report meets its primary purpose...".

material for subjects with opposite needs, can be not correct and negatively affects the reliability of the information supplied by the entity issuing the report.

6. Conclusion

Our paper demonstrates that to develop materiality principle, in a way that could be applicable in the correct way, standard setters should introduce and focus also on what we have called 'enforcing principles'. The reference is both to the stakeholder engagement and to the assurability. To develop materiality within IR, the IIRC should also consider that financial and non-financial information would benefit from defining two specific processes to report about the different forms of capitals. Basing on the GST, we can conclude that the current IR Framework, excluding *stakeholder engagement* (Cerbone and Maroun, 2020), and *assurability* from its considerations, can be compared with a body without lungs that give oxygen to the body/report (stakeholder engagement), , and without kidneys (the assurance providers) that remove wastes and other bad things.

In this way, the lack of other subsystems can dramatically impair the functionality of the circulatory system and affect the sustainability of the whole system, due to the importance of each subsystem to overall survival. From this analysis we can find out that the materiality principle is not a stand-alone one, and that its real effectiveness can be achieved by the implementation of other principles that represent interrelated subsystems of the reporting regulation. This is in line with GST because of the need to know both the parts and the relations between them to better understand the “organized whole” (LvB, 1972, p. 411).

We focus the attention of the IIRC and of its members on the aspects that have not been considered in depth in the IR Framework (2021), but which are useful to achieve a more precise definition that could be helpful for preparers of the report, for its users and for the assurance providers. The practical effectiveness of the non-financial reporting process suffers from these sub-system omissions. The inherent broadening and growth in complexity, complete with incommensurate concepts requiring mutual comparative evaluation, is inevitably raising complexity and increasing also the scope both for potential usefulness and for potential time-consuming irrelevance.

To summarise the arguments, materiality, in very general terms, relates to the concept that information which is worth transmitting via the corporate reporting process should be expected to have some influence or effect on the behaviour of the recipient. IR, as established by the IIRC, again in very general terms, recognizes, or at least pretends to recognise, a sharp increase in the different types of recipients, and in the information such recipients need. It follows that the importance, and the difficulties of effective application, of the materiality principle become greater, the more that IR becomes a genuine extension of information transparency, and not just a rhetorical rehash of traditional ‘financial’ reporting.

A critical aspect is represented by the enormous autonomy granted to the management in the application of the principle (and of the whole report). In fact, the choice about what is material or not is strongly, but surely logically unavoidably, is delegated to the management of the entity. This aspect perhaps increases the concerns arising from the lack of any ‘assurance’ considerations in the Framework as published. The problem of the lack of guidance to ensure the correctness of the

auditor's materiality judgements on non-financial misstatements has been underlined (Moroney and Trotman, 2016; Green and Cheng, 2019).

From our analysis emerges that even if the *definition* of materiality is substantially the same since for a long time – almost a century – on the contrary, the *process* of defining materiality is extremely variable. With reference to the choice of the information to be reported, financial information generally requires only one dimension, based on thresholds, whereas the non-financial information is based on a multi-dimensional approach (that could be represented by 'likelihood of occurrence' and 'magnitude of effects', for IIRC, and by 'influence on stakeholder assessments and decisions' and 'significance of economic, environmental and social impacts', for GRI 4). The process is also different with reference to financial and non-financial information since the first one is only based on the professional judgement of the preparer of the report (and afterwards of the auditors), whereas non-financial information is based on the stakeholder engagement (also defined as 'inclusivity' by AccountAbility). The IR Framework adopts a hybrid way, that seems, theoretically, close to non-financial information, but the 'supposed engagement' is required to be done with an explicit and emphasised focus on providers of financial capital, generating a completely new concept never seen in the literature, nor in operational terms. Materiality should be seen as a mechanism for making complex informational requirements both efficient and effective. But it must certainly not be seen as a mechanism or an excuse for abandoning the objective of satisfying these complex and multitudinous requirements altogether (multiple capitals and multiple stakeholders). Alexander and Blum (2016), and Flower (2015), both accuse the IIRC of precisely such an abandonment.

It is argued that the multi-capital and multi-stakeholder structure of IR (Coulson et al., 2015; Adams, 2015; Doni et al., 2019; Herath et al., 2021), if applied properly without undue emphasis on suppliers of financial capital, significantly increases complexity, and therefore the potential for confusion and 'information overload'. The materiality principle therefore assumes great importance in trying to effectively operationalise IR. The whole area is too complex to expect, or to deliver, formulaic operational conclusions. But we suggest that our analysis of materiality, in principle and in the context of the IIRC project, provides a thought mechanism which will help move towards an effective resolution of the tensions inherent in a more open and broadly-based corporate reporting. Implications for materiality as a principle in its own right also arise. In particular, the ultimately pragmatic nature of the concept in practical application has to be acknowledged, and accepted with all its implications of subjectivity and judgement.

The findings of this research could have an impact on the IIRC agenda. In particular, the multi-capital and multi-stakeholder structure of IR could require greater coordination with other NFI reporting standard setters in a way to avoid lacks in the regulation.

As noted in our Introduction, the process of preparing and issuing a revised IIRC Framework has been completed in January 2021, but this did not make an effective contribution to the main weaknesses of this principle, as this research has highlighted. As a starting suggestion towards improvement, for further refinement, we suggest, to bear in mind that a. "Information is material when its omission or misstatement could reasonably be expected to influence decisions that users make, or its presence is necessary for an understanding of the effects of those decisions *on any and all stakeholders*". The four words decisions, users, effects and stakeholders must be interpreted as having no scope limitations.

Our research has also enlarged the scope of application of the GST, to the word of standard setters and professional bodies' regulations. In our study, IR, has been taken as the exemplar of a complex multidimensional reporting and communication system, that has to work as a practical communication mechanism, across a complex set of circumstances. As GST can support the understanding of the resilience of socio-ecological systems in a similar way it can be used to confirm features of a properly effective and wide-ranging IR corporate reporting model, ecological rather than financial, incorporating the materiality principle, such as complexity, evolution, self-organization, relevance and adaptability (Van Assche et al., 2019).

The application of the GST to accounting and accountability frameworks can open avenues for future researchers analysing the interplays of the different rules/principles and the effectiveness of the whole set of rules issued by standard setters and professional bodies. There is scope for further development of the ideas in this paper, in broadening and deepening both theoretical thinking and practical application.

7. References

- AccountAbility. (2008). AA1000 AccountAbility Principles Standard 2008. Available at <https://www.accountability.org/standards/> (Last accessed 15th May 2021)
- Adams C. (2015). The International Integrated Reporting Council: A call to action; *Critical Perspectives on Accounting*, Vol 27, pp. 23-28.
- Ahrens T. and Dent J.F. (1998). Accounting and Organizations: Realizing the Richness of Field Research, *Journal of Management Accounting Research*, Volume 10, pp. 1-39.
- Alexander, D. and Blum, V. (2016) Ecological Economics: a Luhmannian analysis of integrated reporting; *Ecological Economics*, Vol. 129, pp 241-251.
- Alexander D., Aprile R. Magnaghi E., (2015), Integrated Reporting: a first analysis of the current situation of its Framework in the light of the Comment Letters received (paper presented at the Congrès AFC 2015, Toulouse, France).
- Arul, R., de Villiers, C. and Dimes, R. (2020), Insights from narrative disclosures regarding integrated thinking in integrated reports in South Africa and Japan, *Meditari Accountancy Research*, Vol. ahead-of-print No. ahead-of-print. <https://doi.org/10.1108/MEDAR-06-2020-0934>
- Auditing Practices Board (APB) (1995a). Objective and General Principles Governing the Audit of Financial Statements. Statement of Auditing Standards No. 100, Auditing Practices Board, London.
- Auditing Practices Board (APB) (1995b), Materiality and the Audit. Statement of Auditing Standards No. 220, Auditing Practices Board, London.
- Bebbington, J., Brown, J., Frame, B. and Thomson, I. (2007), Theorizing engagement: the potential of a critical dialogic approach, *Accounting Auditing and Accountability Journal*, Vol. 20 No. 3, pp. 356-381.

- 1
2
3 Bellucci A., Simoni L., Acuti D. and Manetti G. (2019). Stakeholder engagement and dialogic
4 accounting: Empirical evidence in sustainability reporting, *Accounting Auditing and Accountability*
5 *Journal*, Vol. 5, pp. 1467-1499.
- 6
7 Blokdijs H., Driehuisen F., Simunic D. A., and Stein M. T. (2003), Factors Affecting Auditors'
8 Assessments of Planning Materiality. *Auditing: A Journal of Practice & Theory*, Vol. 22, No. 2, pp.
9 297-307.
- 10
11 Boatsman, J. and Robertson, J. (1974), Policy-capturing on selected materiality judgments, *The*
12 *Accounting Review*, 49(2), 342–352.
- 13
14 Boulding, K. E., (1956). General systems theory: the skeleton of science, *Management Science*,
15 Vol. 2 No. 3, pp. 197-208.
- 16
17 Brennan N. and Gray S. (2005), The impact of materiality: accounting's best kept secret, *Asian*
18 *Academy of Management Journal of Accounting and Finance*, AAMJAF, Vol. 1, pp. 1–31.
- 19
20 Brown J. and Dillard J., (2014), Integrated reporting: On the need for broadening out and opening
21 up, *Accounting, Auditing & Accountability Journal*, Vol. 27 Issue 7, pp. 1120 – 1156.
- 22
23 Cadenas H. (2019). The unity of (social systems) science: The legacy of Bertalanffy, *Systems*
24 *Research and Behavioral Science* Vol. 36, Issue 3, pp. 274-280.
- 25
26 Camilleri, M.A. (2015), Environmental, social and governance disclosures in Europe, *Sustainability*
27 *Accounting, Management and Policy Journal*, Vol. 6 No. 2, pp. 224-242.
- 28
29 Carminati L. (2018). Generalizability in Qualitative Research: A Tale of Two Traditions.
30 *Qualitative Health Research*. Vol. 28, Issue 13, pp. 2094-2101.
- 31
32 Carpenter B. W., Dirsmith M. W. and Gupta P. P. (1994), Materiality judgments and audit firm
33 culture: Social-behavioral and political perspectives, in *Accounting, Organizations and Society*
34 Vol.19, Issues 4–5, pp. 355–380.
- 35
36 Cerbone D. and Maroun W. (2020). Materiality in an integrated reporting setting: Insights using an
37 institutional logics framework, *The British Accounting Review*, Vol. 52, 100876
38 <https://doi.org/10.1016/j.bar.2019.100876>
- 39
40 Chong H. Gin, (1998), Materiality in Accounting and Auditing in the UK, A thesis submitted in
41 part fulfilment of the requirements of Sheffield University for the degree of Doctor of Philosophy,
42 June 1998.
- 43
44 Chong H. Gin, (2015), A review on the evolution of the definitions of materiality, *International*
45 *Journal of Economics and Accounting*, Vol. 6, No. 1, 2015, 15-32.
- 46
47 Cooper S.M. and Owen D.L. (2007), Corporate social reporting and stakeholder accountability: The
48 missing link, *Accounting, Organizations and Society*, Elsevier, Vol. 32, No. 7-8, 10.2007, pp. 649-
49 667.
- 50
51 Corporate Reporting Dialogue (2020) available at <https://corporatereportingdialogue.com/about/>
52 Last accessed on 15th May 2021
- 53
54 Coulson, A.B., Adams, C.A., Nugent, M.N. and Haynes, K. (2015), Exploring metaphors of capitals
55 and the framing of multiple capitals: Challenges and opportunities for < IR >, *Sustainability*
56 *Accounting, Management and Policy Journal*, Vol. 6 No. 3, pp. 290-314.
- 57
58
59
60

- 1
2
3 de Villiers, C., Rinaldi, L. and Unerman, J. (2014), Integrated Reporting: Insights, gaps and an
4 agenda for future research, *Accounting, Auditing & Accountability Journal*, Vol. 27 No. 7, pp.
5 1042-1067
6
- 7 Doni, F., Larsen, M., Bianchi Martini, S. and Corvino, A. (2019), Exploring integrated reporting in
8 the banking industry: the multiple capitals approach, *Journal of Intellectual Capital*, Vol. 20 No. 1,
9 pp. 165-188.
- 10 Dumay J., Bernardi C., Guthrie J., Demartini P. (2016). Integrated reporting: a structured literature
11 review, *Accounting Forum*, Vol. 40, No. 3, pp. 166-185.
- 12 Eccles R. G. and Krzus M. P. (2010). One report. Integrated reporting for sustainable strategy,
13 Hoboken, New Jersey: John Wiley & Sons.
- 14 Eccles R. G., Krzus M. P., Rogers J. and Serafeim G. (2012), The Need for Sector-Specific
15 Materiality and Sustainability Reporting Standards, in *Journal of Applied Corporate Finance*, Vol.
16 24 No. 2, pp. 8-14, A Morgan Stanley Publication, Spring 2012.
- 17 Edgley C. (2014) A genealogy of materiality, *Critical Perspectives on accounting*, Vol. 25, Issue 3,
18 pp. 255-271.
- 19 Edgley C., Jones M. J. and Atkins J. (2015) The adoption of the materiality concept in social and
20 environmental reporting assurance: A field of study approach, *The British Accounting Review*, Vol.
21 47, Issue 1, pp. 1-18
- 22 European Commission (2021). Proposal for a Directive of the European Parliament and of the
23 Council amending Directives 2006/43/EC, 2009/65/EC, 2009/138/EU, 2011/61/EU, EU/2013/36,
24 2014/65/EU, (EU) 2015/2366 and EU/2016/2341 available at [https://eur-lex.europa.eu/legal-
25 content/EN/TXT/PDF/?uri=CELEX:52020PC0596&from=EN](https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020PC0596&from=EN) (Last access 15th May 2021)
- 26 Farroq M.B. and de Villiers C. (2019). Understanding how managers institutionalise sustainability
27 reporting. Evidence from Australia and New Zealand, *Accounting Auditing & Accountability
28 Journal*, Vo. 32, No. 5 pp. 1240-1269.
- 29 FASB (1975), The FASB Discussion Memorandum, Criteria for Determining Materiality FASB
30 discussion memorandum: an analysis of issues related to criteria for determining materiality, Ed.
31 Stamford, Connecticut: Financial Accounting Standards Board, 1975.
- 32 Flower J., (2015), The International Integrated Reporting Council: a story of failure, in *Critical
33 Perspectives on Accounting*, Volume 27, pp. 1–17.
- 34 Fraticelli F., (2011), *Dinamiche dei confini aziendali. Concezioni dell'ambiente e scelte
35 organizzative*, XXIV Cycle, PhD Thesis available at <https://core.ac.uk/download/pdf/14703632.pdf>.
36 (Last accessed 15th May 2021)
- 37 Gerwanski J., Kordsachia O. and Velte P. (2019). Determinants of materiality disclosure quality in
38 integrated reporting: Empirical evidence from an international setting, *Business Strategy and the
39 Environment*, Vol. 28, pp. 750-770.
- 40 Gordon, S., (1933), Accountants and the Securities Act. *Journal of Accountancy*, November, 438.
- 41 Green W.J., and Cheng M.M. (2019). Materiality judgments in an integrated reporting setting: The
42 effect of strategic relevance and strategy map, *Accounting Organization and Society*, Vol. 73, pp. 1-
43 14.
- 44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

- 1
2
3 GRI (Global Reporting Initiative), (2013) GRI4 – G4 Sustainability Reporting Guidelines available
4 at <https://www2.globalreporting.org/standards/g4/Pages/default.aspx> Last accessed on 30th May
5 2020
6
7 GRI (Global Reporting Initiative), (2016) GRI Standards, GRI 101: Foundation, GRI 102: General
8 Disclosure, GRI 103: Management Approach.
9 <https://www.globalreporting.org/standards/media/1036/gri-101-foundation-2016.pdf#page=%2010>
10 (Last accessed on 15th May 2021)
11
12 Hatch, M. J., (1997) Organization Theory: Modern, Symbolic and Postmodern Perspectives, Oxford
13 University Press, Oxford.
14
15 Heitzman S., Wasley C. and Zimmerman J., (2010), The Joint Effects of Materiality Thresholds
16 and Voluntary Disclosure Incentives on Firms' Disclosure Decisions, Journal of Accounting and
17 Economics, Vol. 49, pp. 109-132.
18
19 Herath, R., Senaratne, S. and Gunarathne, N. (2021), Integrated thinking, orchestration of the six
20 capitals and value creation, Meditari Accountancy Research, Vol. ahead-of-print No. ahead-of-
21 print. <https://doi.org/10.1108/MEDAR-01-2020-0676>
22
23 Hofkirchner W. (2019), Social relations: Building on Ludwig von Bertalanffy, Systems Research
24 and Behavioral Science, Vol. 36, Issue 3, pp. 263-273.
25
26 Horkheimer, M. (1972). Critical Theory: Selected Essays, The Continuum Publishing Company,
27 US, New York.
28
29 Horkheimer, M. (1993[1931]) Between Philosophy and Social Science. Selected Early Writings
30 Boston, MA: MIT Press.
31
32 IFRS (2021) IAS 1 Presentation of Financial Statements, available at <https://www.ifrs.org/issued-standards/list-of-standards/ias-1-presentation-of-financial-statements/> (Last accessed on 15th May
33 2021)
34
35 International Federation of Accountants IFAC (2015). Materiality in <IR>. Guidance for the
36 preparation of integrated reports, November 2015, available at
37 <https://www.ifac.org/system/files/publications/files/Materiality-in-Integrated-Reporting.pdf>. (Last
38 accessed on 15th May 2021).
39
40 IFRS (2018). IFRS Conceptual Framework for Financial Reporting, March 2018. Available at
41 <https://www.ifrs.org/projects/2018/conceptual-framework/> (Last accessed on 15th May 2021).
42
43 IFRS (2018). IFRS Standards. Definition of Material. Amendments to IAS 1 and IAS 8, October
44 2018. Available at
45 <https://www.efrag.org/Assets/Download?assetUrl=%2Fsites%2Fwebpublishing%2FMeeting%20Documents%2F1709060818526684%2F04-05%20Definition%20of%20Material%20-%20Published%20Amendments%20-%20EFRAG%20TEG%2018-11-29.pdf> (Last accessed on 15th
46 May 2021)
47
48 IRC of South Africa, Integrated Reporting and Integrated Report, Discussion Paper, 25 January
49 2011; Integrated Reporting. Communicating Value in the 21st Century, Discussion Paper,
50 September 2011
51
52
53
54
55
56
57
58
59
60

1
2
3 IIRC International Integrated Reporting Council (2012a) Draft Framework outline. Available at
4 <https://integratedreporting.org/wp-content/uploads/2012/07/Draft-Framework-Outline.pdf> (last
5 accessed 15th May 2021)
6

7 IIRC International Integrated Reporting Council (2012b) Prototype Framework of the International
8 <IR> Framework. Available at [https://integratedreporting.org/wp-](https://integratedreporting.org/wp-content/uploads/2012/11/23.11.12-Prototype-Final.pdf)
9 [content/uploads/2012/11/23.11.12-Prototype-Final.pdf](https://integratedreporting.org/wp-content/uploads/2012/11/23.11.12-Prototype-Final.pdf) (Last accessed 15th May 2021)
10

11 IIRC International Integrated Reporting Council website: <http://www.theiirc.org/the-iirc/> at the date
12 of the 28th of August 2014 and of the 31st of December 2012. (Last accessed 30th May 2020)
13

14 IIRC International Integrated Reporting Council (2013a) Materiality Background Paper for <IR>.
15 Available at [https://integratedreporting.org/wp-content/uploads/2013/03/IR-Background-Paper-](https://integratedreporting.org/wp-content/uploads/2013/03/IR-Background-Paper-Materiality.pdf)
16 [Materiality.pdf](https://integratedreporting.org/wp-content/uploads/2013/03/IR-Background-Paper-Materiality.pdf) (Last accessed 30th May 2020)
17

18 IIRC International Integrated Reporting Council (2013b) Consultation Draft Framework.
19 [https://integratedreporting.org/wp-content/uploads/2013/03/Consultation-Draft-of-the-](https://integratedreporting.org/wp-content/uploads/2013/03/Consultation-Draft-of-the-InternationalIRFramework.pdf)
20 [InternationalIRFramework.pdf](https://integratedreporting.org/wp-content/uploads/2013/03/Consultation-Draft-of-the-InternationalIRFramework.pdf)
21

22 IIRC International Integrated Reporting Council (2013c) IR Framework. Available at
23 [https://integratedreporting.org/wp-content/uploads/2013/12/13-12-08-THE-INTERNATIONAL-IR-](https://integratedreporting.org/wp-content/uploads/2013/12/13-12-08-THE-INTERNATIONAL-IR-FRAMEWORK-2-1.pdf)
24 [FRAMEWORK-2-1.pdf](https://integratedreporting.org/wp-content/uploads/2013/12/13-12-08-THE-INTERNATIONAL-IR-FRAMEWORK-2-1.pdf) (Last accessed 30th May 2020)
25

26 IIRC International Integrated Reporting Council (2014) Assurance on <IR> An Introduction to the
27 discussion. Available at [https://integratedreporting.org/wp-content/uploads/2014/07/Assurance-on-](https://integratedreporting.org/wp-content/uploads/2014/07/Assurance-on-IR-an-introduction-to-the-discussion.pdf)
28 [IR-an-introduction-to-the-discussion.pdf](https://integratedreporting.org/wp-content/uploads/2014/07/Assurance-on-IR-an-introduction-to-the-discussion.pdf) (Last accessed 30th May 2020)
29

30 IIRC International Integrated Reporting Council (2014) Assurance on <IR> An Exploration of
31 Issue. Available at [https://integratedreporting.org/wp-content/uploads/2014/07/Assurance-on-IR-an-](https://integratedreporting.org/wp-content/uploads/2014/07/Assurance-on-IR-an-exploration-of-issues.pdf)
32 [exploration-of-issues.pdf](https://integratedreporting.org/wp-content/uploads/2014/07/Assurance-on-IR-an-exploration-of-issues.pdf) (Last accessed 30th May 2020)
33

34 IIRC International Integrated Reporting Council (2017) Available at
35 [https://integratedreporting.org/news/clarify-simplify-amplify-global-consultation-results-on-the-](https://integratedreporting.org/news/clarify-simplify-amplify-global-consultation-results-on-the-progress-towards-integrated-reporting/)
36 [progress-towards-integrated-reporting/](https://integratedreporting.org/news/clarify-simplify-amplify-global-consultation-results-on-the-progress-towards-integrated-reporting/) (Last accessed on 30th May 2020)
37

38 IIRC International Integrated Reporting Council (2018) Materiality: Driving integrated thinking,
39 available at <https://integratedreporting.org/news/materiality-driving-integrated-thinking/> (Last
40 accessed on 30th May 2020)
41

42 IIRC International Integrated Reporting Council, (2021a). International <IR> Framework Available
43 at [https://integratedreporting.org/wp-](https://integratedreporting.org/wp-content/uploads/2021/01/InternationalIntegratedReportingFramework.pdf)
44 [content/uploads/2021/01/InternationalIntegratedReportingFramework.pdf](https://integratedreporting.org/wp-content/uploads/2021/01/InternationalIntegratedReportingFramework.pdf) (Last accessed on 31
45 March 2021)
46

47 IIRC International Integrated Reporting Council, (2021b) International <IR> Framework 2013-
48 2021 comparison, available at [https://integratedreporting.org/wp-](https://integratedreporting.org/wp-content/uploads/2021/03/Framework-comparison-2013-to-2021.pdf)
49 [content/uploads/2021/03/Framework-comparison-2013-to-2021.pdf](https://integratedreporting.org/wp-content/uploads/2021/03/Framework-comparison-2013-to-2021.pdf) (Last accessed on 31th March
50 2021).
51

52 Johnson A., Kast R.F. and Rosenzweig J.E. (1967). Theory and Management of Systems,
53 McGrawHill Education, New York, London.
54
55
56

- 1
2
3 Kolk, A. (2008), Sustainability, accountability and corporate governance: exploring multinationals'
4 reporting practices. *Business Strategy and Environment*, Vol. 17 pp. 1-15.
- 5
6 Korstjens I. and Moser A. (2018) Series: Practical guidance to qualitative research. Part 4:
7 Trustworthiness and publishing, *European Journal of General Practice*, Vol. 24, Issue 1, pp. 120-
8 124
- 9
10 KPMG (2019). Impact of ESG disclosures. Embracing the future.
11 <https://assets.kpmg/content/dam/kpmg/xx/pdf/2019/09/impact-of-esg-disclosures.pdf>
- 12
13 Lai, A., Melloni, G. and Stacchezzini, R. (2017), What does materiality mean to integrated
14 reporting preparers? An empirical exploration, *Meditari Accountancy Research*, Vol. 25 No. 4, pp.
15 533-552.
- 16
17 Lee, T. (1984) *Materiality: A Review and Analysis of its Reporting Significance and Auditing*
18 *Implications*, Auditing Practices Committee of the CCAB, London, UK.
- 19
20 Lincoln Y.S., Guba E.G. (1985). *Naturalistic inquiry*. California: Sage Publications.
- 21
22 Machado, BAA, Dias, LCP, (2021). Fonseca, A. Transparency of materiality analysis in GRI-based
23 sustainability reports. *Corporate Social Responsibility and Environmental Management*. 28: 570–
24 580. <https://doi.org/10.1002/csr.2066>
- 25
26 Mallin, C., Michelon, G. and Raggi, D. (2013). Monitoring Intensity and Stakeholders' Orientation:
27 How Does Governance Affect Social and Environmental Disclosure?, *Journal of Business Ethics*,
28 Vol. 114, pp. 29–43.
- 29
30 Manetti G. (2011). The quality of stakeholder engagement in sustainability reporting: empirical
31 evidence and critical points. *Corporate Social Responsibility and Environmental Management*, 18:
32 110-122. <https://doi.org/10.1002/csr.255>
- 33
34 McElroy M.W. and Thomas M.P., (2015). The multicapital scorecard, *Sustainability Accounting,*
35 *Management and Policy Journal*, Vol. 6 No. 3, 2015, pp. 425-438.
- 36
37 Melloni G., Caglio A. and Perego P. (2017). Saying more with less? Disclosure conciseness,
38 completeness and balance in Integrated Reports, *Journal of Accounting, Public and Policy*, Vol. 36,
39 Issue 3, pp. 220-238.
- 40
41 Messier W. F. Jr, Martinov-Bennie N. and Eilifsen A. (2005). A review and integration on
42 empirical research on materiality: two decades later, in *Auditing A Journal of Practice and Theory*,
43 Vol. 24, Issue 2, pp. 153-204.
- 44
45 Mio C. and Fasan M., (2014), *The Determinants of Materiality Disclosure in Integrated Corporate*
46 *Disclosure* (December 1, 2013). Department of Management, Università Ca' Foscari Venezia
47 Working Paper No. 2014/9. Available at SSRN: <https://ssrn.com/abstract=2443929> or
48 <http://dx.doi.org/10.2139/ssrn.2443929>
- 49
50 Mio C., Fasan M., Costantini A. (2019). Materiality in integrated and sustainability reporting: A
51 paradigm shift?, *Business Strategy and the Environment*, Vol. 29, pp. 306-320.
- 52
53 Montgomery, N. and Jennings, A., (1949), *Montgomery's Auditing*, New York: The Ronald Press
54 Company.
- 55
56 Moroney, R., and Trotman, K. T. (2016). Differences in auditors' materiality assessments when
57 auditing financial and sustainability reports. *Contemporary Accounting Research*, Volume 33, Issue
58 2, pp. 551-575.
- 59
60

- 1
2
3 O'Dwyer B. and Owen D.L. (2005), Assurance statement practice in environmental, social and
4 sustainability reporting: a critical evaluation, *The British Accounting Review*, Vol. 37, Issue 2, pp.
5 205–229.
6
7 Passetti, E., Bianchi, L., Battaglia, M. and Frey, M. (2019). When democratic principles are not
8 enough: tensions and temporalities of dialogic stakeholder engagement, *Journal of Business Ethics*,
9 Vol. 155 No. 1, pp. 173-190.
10
11 Plumlee M. A., (2003). The Effect of Information Complexity on Analysts' Use of That
12 Information. *The Accounting Review*, Vol. 78 Issue 1, pp. 275–296.
13
14 Pondy L.R. and Mitroff I.I. (1979), Beyond open system. Models of organization, *Research in*
15 *Organizational Behaviour*, Vol. 1, pp. 3-39.
16
17 Puroila J. and Mäkelä H., (2019). Matter of opinion. Exploring the socio-political nature of
18 materiality disclosures in sustainability reporting, *Accounting, Auditing and Accountability Journal*,
19 Vol. 32 No. 4, pp. 1043-1072.
20
21
22 Roome N. and Wijen F., (2006). Stakeholder Power and Organizational Learning in Corporate
23 Environmental Management, *Organization Studies*, Vol. 27, Issue 2, pp. 235-263.
24
25 Ruzzeddu M., (2012), *Tra ordine e incertezza. La complessità nel terzo millennio*, Aracne, Roma.
26
27 Saenz, C. (2019). Creating shared value using materiality analysis: Strategies from the mining
28 industry. *Corporate Social Responsibility and Environmental Management*. 26: 1351– 1360.
29 <https://doi.org/10.1002/csr.1751>
30
31 Scott, R., (1992). *Organizations: Rational natural and open systems*, Englewood Cliffs, N.J.,
32 Prentice Hall, 1992; Italian translation (1994), *Le organizzazioni*, Il Mulino, Bologna.
33
34 SEC (1999), *Staff Accounting Bulletin: No. 99 – Materiality*, available at
35 <http://www.sec.gov/interps/account/sab99.htm>. Last accessed on 30th May 2020
36
37 Sierra-García L., Zorio-Grima A., and García-Benau M.A., (2015). Stakeholder Engagement,
38 Corporate Social Responsibility and Integrated Reporting: An Exploratory Study, *Corporate Social*
39 *Responsibility and Environmental Management*, Vol. 22, Issue 5, pp. 286-304.
40
41 Solomon J. and Maroun W., (2012). Integrated reporting: the influence of King III on social, ethical
42 and environmental reporting, in ACCA, ACCA, (Ed.), *Integrated Reporting: The New Face of*
43 *Social, Ethical and Environmental Reporting in South Africa?*, The Association of Chartered
44 Certified Accountants, London.
45
46
47 Stolowy H. and Paugam R., (2018) The expansion of non-financial reporting: an exploratory study,
48 *Accounting and Business Research*, Vol. 48, No. 5, pp. 525-548.
49
50 Stubbs W. and Higgins C., (2014), *Integrated Reporting and internal mechanisms of change*,
51 *Accounting, Auditing & Accountability Journal*, Vol. 27 Issue 7, pp. 1068 – 1089.
52
53 Stubbs, W., and Higgins, C. (2018). Stakeholders' Perspectives on the Role of Regulatory Reform
54 in Integrated Reporting. *Journal of Business Ethics* Vol. 147, pp. 489–508.
55
56 Torelli R., Balluchi F., and Furlotti K., (2020). The materiality assessment and stakeholder
57 engagement: A content analysis of sustainability reports, *Corporate Social Responsibility and*
58 *Environmental Management*, Vol. 27, Issue 2, pp. 470-484.
59
60

- 1
2
3 Van Assche C., Verschraegen G., Valentinov V., M. (2019). The social, the ecological, and the
4 adaptive. Von Bertalanffy's general systems theory and the adaptive governance of
5 social-ecological systems, *Systems Research and Behavioral Science*, Vol. 36, Issue 3, pp. 308-321.
6
7 Van Assche C., Valentinov V. and Verschraegen G., (2019). Ludwig von Bertalanffy and his
8 enduring relevance: Celebrating 50 years General System Theory, Guest Editorial, *Systems*
9 *Research and Behavioral Science*, Vol. 36, Issue 3, pp. 251-254.
10
11 Vanderstraeten R. (2019), Systems everywhere?, *Systems Research and Behavioral Science* Vol.
12 36, Issue 3, pp. 255-262.
13
14 Von Bertalanffy, L. (1934). *Kritische Theorie der Formbildung*, Berlin, Borntraeger; translated in.
15 *Modern Theories of Development*, Oxford, Oxford University Press.
16
17 Von Bertalanffy, L. (1968). *General Systems Theory. Foundations, Development, Applications*,
18 George Brazziler, New York.
19
20 Von Bertalanffy, L. (1972). The History and Status of General Systems Theory, *Academy of*
21 *Management Journal*, Vol. 15, No. 4, pp. 407-426.
22
23 Wallage P. (2000). Assurance on Sustainability Reporting: An Auditor's View. *AUDITING: A*
24 *Journal of Practice & Theory* Vol. 19 (s-1) pp. 53–65.
25
26 WBCSD, World Business Council for Sustainable Development (2016). Reporting Matters.
27 Communicating on the Sustainable Development Goals. WBCSD 2016 Report. Available at
28 [https://www.wbcsd.org/Programs/Redefining-Value/External-Disclosure/Reporting-](https://www.wbcsd.org/Programs/Redefining-Value/External-Disclosure/Reporting-matters/Resources/Reporting-matters-2016)
29 [matters/Resources/Reporting-matters-2016](https://www.wbcsd.org/Programs/Redefining-Value/External-Disclosure/Reporting-matters/Resources/Reporting-matters-2016) (Last accessed 30th May 2020).
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
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Table 1: Overview on “materiality” by some regulators

STANDARD SETTER	REFERENCE	DEFINITION	MAIN STAKEHOLDERS ADDRESSED	NOTES
International Accounting Standard Board (IASB)	Conceptual Framework IAS 1	“Information is material if omitting misstating or obscuring it could reasonably be expected to influence the decisions that the primary users of general purpose financial statements make on the basis of those financial statements, which provide financial information about a specific reporting entity” (IASB, Definition of Material - Amendments to IAS 1 and IAS 8, October 2018, Conceptual Framework for Financial Reporting, Pr. 2.11.).	Providers of capitals	Disclosure requirements of International Standards need not be met if the resulting information is not material. It is worth emphasising that the whole approach here is both subjective and entity/context specific. Judgement is inevitably required. The ‘users’ considered by IASB are significantly narrower and more specific than is often the case. Such narrowing inevitably makes the application of the materiality principle, in a sense in only one dimension rather than several at once, a less complicated process.
International Standard on Auditing (ISA)	ISA 320	“Although financial reporting frameworks may discuss materiality in different terms, they generally explain that: • Misstatements, including omissions, are considered to be material if they, individually or in the aggregate, could reasonably be expected to influence the economic decisions of users taken on the basis of the financial statements; • Judgments about materiality are made in light of surrounding circumstances, and are affected by the size or nature of a misstatement, or a combination of both; and • Judgments about matters that are material to users of the financial statements are based on a consideration of the common financial	Users of financial statements	ISA includes a sort of definition of the ‘rational user’; the requirement of defining the level of probability guaranteeing that the aggregate of uncorrected and undetected misstatements exceeds the materiality threshold; the necessity of updating and documenting the process of definition of the materiality thresholds.

		information needs of users as a group. ² The possible effect of misstatements on specific individual users, whose needs may vary widely, is not considered” (ISA 320, Pr. 2)		
Global reporting Initiative (GRI)	GRI 4 GRI Standards	“1.3 The report shall cover topics that: 1.3.1 reflect the reporting organization’s significant economic, environmental, and social impacts; or 1.3.2 substantively influence the assessments and decisions of stakeholders”. (GRI 101 Foundation 2016 Pr. 13.1)	Organization – main groups of stakeholders	Material aspects are those that reflect the organization’s significant economic, environmental and social impacts; or substantively influence the assessments and decisions of stakeholders. Organizations must select only the topic-specific standards that are applicable, based on material topics. GRI 101 Foundation includes the Reporting Principles for defining report content and quality. Materiality is one of the four Reporting Principles about report content (i.e., Stakeholder Inclusiveness, Sustainability Context, Completeness).
AccountAbility	AA1000 Accountability Principles Standard 2008	Key definitions “Materiality relates to identifying and prioritising the most relevant sustainability topics, taking into account the effect each topic has on an organisation and its stakeholders. A material topic is a topic that will substantively influence and impact the assessments, decisions, actions and performance of an organisation and/or its stakeholders in the short, medium and/or long term. (p. 20)	Organization	Three AA1000 AccountAbility Principles: <ul style="list-style-type: none"> ✓ the Foundation Principle of Inclusivity; ✓ the Principle of Materiality; ✓ The Principle of Responsiveness
IFAC	Materiality in <IR> Guidance for the preparation of integrated reports, 2015	“In the context of Integrated Reporting, a matter is material if it could substantively affect the organization’s ability to	Organization	This guidance explains the definition and the materiality determination process within the <IR> Framework It outlines the expectations about the materiality-related

		create value in the short, medium or long term". (p. 8)		disclosures
European Commission	Proposal for a Directive of the European Parliament and of the Council amending Directive 2013/34/EU, Directive 2004/109/EC, Directive 2006/43/EC and Regulation (EU) No 537/2014, as regards corporate sustainability reporting, 2021	The NFRD introduced a requirement for companies to report both on how sustainability issues affect their performance, position and development (the 'outside-in' perspective), and on their impact on people and the environment (the 'inside-out' perspective). This is often known as 'double materiality'. (EU Proposal for NFRD, Pr. 1, p. 1)	Broad range of stakeholders	Multistakeholders groups; separate consultation meetings.

Source: own elaboration

Table 2. Principles underlying the IR structure

PRINCIPLES	TYPOLGY	PURPOSE
Focus Main users Usefulness approach	Principles underlying the reporting system	To define the borders and the objects of the reporting system.
Completeness Conciseness Reliability Timeliness Balance between information	Requirements of the reporting system	To define the boundaries and the characteristics required by the report.

Source: own elaboration

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Table 3. Principles surrounding the subsystem of materiality

PRINCIPLES	TYOLOGY	PURPOSE
Usefulness, Reliability Conciseness Cost/benefit approach	Principles overarching the materiality subsystem	To address information supplied and the concept of materiality
Completeness Timeliness Balance between information	Interplays with other subsystems	To define interactions with the whole system and other subsystems
Reliability Stakeholder engagement and inclusiveness Assurability of the report	Enforcing principles	To guarantee the correct application of the IR rules and to guarantee a correct approach to the materiality principle and its applications.
Disclosure of the process of defining materiality	Aspects that preserve and maintain the integrity of the materiality subsystem	To disclose to users the way in which materiality has been set and applied.

Source: own elaboration