



Assessing the Sustainability Performance of Entities

A review and classification of tools, methods, and approaches

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Short Paper

Introduction and Background

There is a plethora of approaches to sustainability performance measurement that have emerged over the preceding decades (Maltz et al., 2016; Nicolăescu et al., 2015). In the search for effective ways to increase countries, cities, companies and individual's contribution to sustainable development, the concept of sustainable performance measurement has emerged as a promising approach (Searcy, 2011). This raises the question of how "*performance*" is to be measured, assessed, and hence managed from a sustainability-oriented perspective and what assessment criteria need to be applied to enable decision makers to steer their entity in the intended direction in a purposeful way (Schaltegger & Wagner, 2006). By entity we mean a designated unit of analysis such as a creature, company, community, city, country, continent, or cosmos (Chebaeva et al., 2021). This study will aim to tabulate the various approaches (e.g.: tools, methods, and techniques) by identifying the significant criteria (e.g.: feature, characteristic, and trait) between them.

Previous research in this fragmented and transdisciplinary field (Lang et al., 2012) has focused on the identification of the current (unsustainable) status quo. However, both scholars and practitioners continue to have a need to appropriately capture the different sustainability effects or strategies of corporate activities, governments as well as individual consumers (Breuer et al., 2018; Foss & Saebi, 2016; Geissdoerfer et al., 2018; Lüdeke-Freund et al., 2015; Morioka et al., 2016).

Research on sustainability performance in different contexts is becoming increasingly important, leading to the development of numerous concepts, methods, and tools with increasing difficulty in tracking progress and structuring existing knowledge (Myllyviita, Antikainen & Leskinen, 2017; Poveda & Lipsett, 2011). For example, much research has been undertaken at the organizational level with few studies aimed at overall sectors, and fewer still at the regional level. Choice and segregation of material topics also vary wildly, with some nomenclatures incorporating just a few categories, whilst other incorporating hundreds of targets (e.g., Sustainable Development Goals).

Many researchers characterize the broader sustainability assessment literature as potentially confusing and difficult to navigate and criticize the usage of different terminologies and sustainability assessment methods (Hacking & Guthrie, 2008), making it considerably more difficult to standardize sustainability assessment methods to enable the comparison of the measured sustainability performance. Furthermore, a lack of specific goals makes the assessment of sustainability activities challenging (Rauter et al., 2017). By associating a corresponding strategy or (entity) model, one is able to elucidate the link between sustainability performance and strategy assessment.

The applicability of existing sustainability assessment methods is as much diverse as numerous (Pope et al., 2017). In attempting to structure the various ramifications in the literature, reviews of specific indicator systems have emerged that facilitate, for example, the assessment of corporate sustainability performance (Labuschagne, Brent & Erck, 2005); and/or link business models to corporate performance and competitive advantage (Breiby & Wanberg 2011; Boons & Lüdeke-Freund 2013; Kiron et al. 2017; Pansera & Randles 2013; Prasad & Junni 2017; Varadarajan 2017). Yet, thus far, no assessment method for corporate sustainability has become the standard in academia or practice (Montiel & Delgado-Ceballos, 2014). Still lacking is a systematic analysis of the applicability of pre-existing sustainability assessment methods on an entity level basis. In this study, we undertake, a diligent and rigorous analysis of the most appropriate approaches based on an assessment against predefined objective criteria to bridge this gap. Hence our focus is to address the following research questions: (1) What approaches measuring the sustainability performance on an entity level can be identified from an analysis of existing literature? (2) How can these approaches be classified?

Methodology and Approach

From an examination of 856 documents, including 291 Q1 journals, 22 approaches have been uncovered and examined. The identified characteristics were ultimately consolidated into fourteen criteria and tabulated, highlighting areas of difference and similarities (**Table 1**). The outcome was derived by refinement through successive rounds of reviews by three independent experts. A summary of some of the approaches examined are found in **Appendix A**.

These criteria were best illuminated as the result of a comprehensive review of the extant literature in the fields of industrial ecology, business model innovation, sustainability metrics, and informed by the natural and social sciences (Persson et al., 2018b). The criteria sought in this study advocate for harmonization and thus a consolidation of the field under review. In developing such criteria, a broad multi-level entity perspective approach was adopted encapsulating the performance of entities from the nano to the macro scale. The entity levels are Creature, Company, Community, City, Country, Continent, and Cosmos (Fedeli, 2020) as depicted in **Figure 1**. Thus, when evaluating the performance of an entity, it is in respect to its associated scale-linked level, whereby each level is completely usurped by the one above it. This hierarchical structure enforces a strongly sustainable approach (Upward & Jones 2015) and builds on the Framework for Strategic Sustainable Development (FSSD) (Broman & Robèrt, 2017), thereby ensuring meaningful context-based impact measurement and assessment (Haffar & Searcy, 2018).

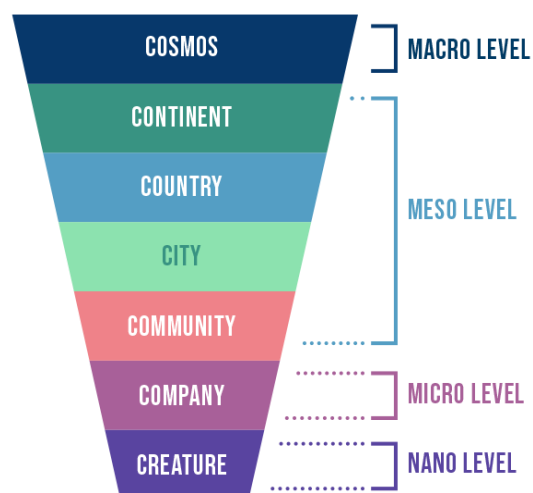


FIGURE 1. ASSAILING THE 7Cs. FEDELI (2020).

The first criteria elaborated on, that identifies approaches to measure sustainability performance, is #1, which categorizes the type of provider being examined. Worth noting is that criteria #2, #3 and #4 are necessary, in order to, replicate the findings. Criteria #5 considers whether the approach is multi-level, with criteria #6 directly addressing whether the entity model (such as the business model) is fully described by the assessment methodology.

#	Criteria	Description
1	Type of provider (Platform/Framework/Method/Data)	This criterion specifies if the approach under review is a platform tool, an underlying framework which brings together disparate methods, purely a method or simply a place to find data regarding entity (e.g. business, sector, governance) model assessment such as a report.
2	Explicit Data Sources (Yes/No)	This criterion states whether the approach under consideration explicitly reveals the source of the dataset used in their evaluation.
3	Public Data (Yes/No)	This criterion specifies whether the dataset in use is publicly available or otherwise.
4	Explicitly Public Methodology (Yes/No)	This criterion specifies whether the methodology is made explicit in detail, to the extent that the findings could be replicated.
5	Multi Entity Levels (Yes /No)	This criterion identifies whether the approach is applicable at more than one entity level. For details of the level in question adopted, please refer to point #8.
6	Includes Entity Model (Yes/No)	This criterion specifies in the associated entity model is deemed as explicitly identified in the approach. For example, at the enterprise level this could be the business model, at the city level it may be the governance model.
7	Perspective	This criterion identifies the perspective by which the assessment is being made, i.e. consumer, corporate, stakeholder, investor, governance, or society.
8	Entity Level (7Cs)	This criterion is based on the "Assailing the seven Cs" study which categorizes impacts along a continuum spanning seven levels from the nano to the macro scale. Further explanation found in this article.
9	Context-based metrics (Yes/ No)	This criterion informs whether impacts are assessed relative to norms or are used as simple numerators without being applied with respect to the context within these impacts occur.
10	Determines Impact or Sustainability (Yes/No)	This criterion specifies if the assessed score determines impact or sustainability performance.
11	Score type (Qualitative, Quantitative)	This criterion indicates if the score is of a qualitative or quantitative nature. Some scores are simple disclosure, others are referential or relative, or yet absolute.
12	Single or Multi Topic /Multi-capital /Triple-bottom-line (Yes/No)	This criterion identifies is the scoring methodology is across a single topic, multiple topics or indeed, as a matter of intent, across the three pillars of sustainability.
13	Topic Alignment	This criterion indicates if the assessment method is self-defined or follows a known set standard such as Global Reporting Initiative (GRI), Sustainable Development Goals (SDG) or B Corp etc.
14	Output (Report/Platform)	This criterion indicates if the output of the assessment is static, in the form of a report, or dynamic, such as an interactive database-driven platform or tool.

TABLE 1. LIST OF CRITERIA WITH EXPLANATIONS EVALUATED IN THIS STUDY.

Next, #7 and #8 considers the entity and level at which it operates as depicted in the 7Cs. Importantly, #9 looks at whether the impacts are measured within the context of the ecosystem within which the entity operates. Criteria #10 specifies if a score is arrived at, and #11 defines if it is of a quantitative or qualitative nature. Criteria #12 details whether the scoring method uses a single material topic or several and whether they are across all three pillars of sustainability: the economic, social, and the environmental. On this latter point, criteria #13 specifies if there is an alignment with a particular established standard, with #14 indicating if the result is in the form of a static report or an interactive tool. **Table 1** provides an overview of the elaborated criteria to classify the identified approaches to measure sustainability performance.

Findings and Discussion

The aim of this study was to extensively examine and tabulate several of the various approaches that emerged over the last fifteen years across identified significant criteria with a view to provide a basis for ostensibly linking sustainability performance to business models, or more generically entity model innovation strategies. A promising initial step in this context was provided by Lüdeke-Freund et al. (2017) who proposed a basic framework for the assessment of sustainability-oriented business models (SUST-BMA) and created a conceptual foundation. This field of research has hereby been identified as sustainable entity (e.g., business) model innovation strategy. Building upon this foundation together with the 7Cs, this study went one step further and highlighted how the entity model concept can be applied at several levels (e.g. business model, sector model, governance model) and indeed is a requisite for assessing the strong sustainability performance of entities.

The comprehensive review of the literature highlighted a diversity of terminology in use across the disciplines associated with this study. Whilst parts of the scientific community associate sustainability assessment mainly on a policy-, project-, or program-level (Bond, Morrison-Saunders & Pope, 2012; Bond & Morrison-Saunders, 2011; Pope et al., 2017), other researchers use the term sustainability assessment in a broader context and understand organization- and product-related assessment methods as forms of sustainability assessment (Angelakoglou & Gaidajis, 2015; Ness et al., 2007; Singh et al., 2012). This exploratory study was a first attempt to develop categories of criteria, and thus was limited to the investigation of a range of common established practical approaches as revealed in the literature.

Adopting a qualitative content analysis of the literature (Gläser & Laudel, 2010; Mayring, 2015) and supporting documents from several previous studies, we find a most useful approach to yielding baseline know-how, illuminating several insights for future research directions. Each approach listed in **Table 1** has its supporters and detractors. Numerous “yardsticks” have been proposed over time, each with its unique appeal. In this study, we provided a compendium of the most promising assessment methods, and contend that

integration offers a promising way forward, through the creation of a universal framework which bridges the gap between these “standards”. The prospect of harmonization between the various approaches, yields the basis for creating a universal, uniform, and standardized approach.

Hence, in this study, identified criteria are tabulated, reviewed, re-assessed, re-organized, and retabulated based on a succession of peer-reviewed rounds with industry experts and academics (Day & Bobeva, 2005). Whilst complete reconciliation of expert feedback is unlikely, the tabulated results serve to inform future research. This lays the foundations for consolidating and developing congruent universal tools, methods, and approaches to sustainable entity (e.g., business, sector, government) model innovation strategies.

Conclusion and Contribution

Against this background, this work aimed to present practicable approaches and requirements to assess the sustainability performance on an entity level basis, and thus actively assist entities to manage the sustainable impact of the respective entities as they transform towards becoming more sustainable (Fedeli, 2019). This study offers the potential for the design (Gholami, 2016; Wahl & Baxter, 2008) of a class of coherent solutions aimed at sustainable entity model innovation strategies.

Significant identified criteria, as supported by the literature, include transparency (Lydenberg et al., 2010), evidence-based (Persson et al., 2018a), measurements linked to practical knowledge (Lang et al., 2012), mass adoption (e.g.: Sustainable Development Goals) (Eccles, 2012), consolidated standard (Williams et al., 2017), context-based (Haffar & Searcy, 2018), and perspective (Abdelkafi & Täuscher, 2015; Evans et al., 2017; Holmberg et al., 2012; Schaltegger et al., 2017), to name a few. The contribution of this work is two-fold: First, based on a review of extant literature, we provided an analysis of existing approaches to sustainability performance measurement. Secondly, it investigated how these existing approaches to sustainability performance measurement may be identified and structured using 14 different criteria, which are potentially applicable on several entity levels (Beckett, 2016).

Further contribution to this research includes refinement of the criteria shown in **Table 1**, based on the corresponding entity-level paradigm. This table summarizes the discovery of the characteristics of the various approaches, thereby forming the basis for strong-sustainability informed comparisons. This opens the avenue for consolidation and development of uniform methods, frameworks, and tools for implementing sustainable entity model innovation strategies across each of the scale-linked levels.

Keywords

Sustainability performance measurement, Sustainable business model, Innovation strategies, Entity model, Scale-linked, Framework for Strategic Sustainable Development

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APPENDIX A

The following table illustrates the 14 criteria illuminated by the literature and used as the basis of comparison between the approaches indicated in the left-hand column. Six approaches are summarized here, with full details available in the complete study.

	Type of provider	Explicit Data Sources (Yes/No)	Public Data (Yes/No)	Explicitly Public Methodology (Yes/No)	Multi Entity Levels (Yes /No)	Includes Entity Model (Yes/No)	Perspective	Entity Level (7Cs)	Context -based (Yes/ No)	Determines Impact or Sustainability (Yes/No)	Score type	Single or Multi Topic / Multi-capital / TBL	Topic Alignment	Output
Corporate Knights	Platform	No	Yes	No	No	No	Corporate	Company	Yes	Yes	Quantitative	Multi Topic	Standard	Report
GRI Reports	Framework	Yes	Yes	No	Yes	Yes	Corporate, Investors, Governance, Society Stakeholder	Company	Yes	Yes	Quantitative	Multi Topic	Disclosure	Tool
IIRC <IR>	Framework	No	Yes	No	No	Yes	Corporate	Company	No	Yes	Qualitative	Multi Topic	Standard	Tool
SASB	Framework	Yes	Yes	No	Yes	Yes	Corporate, Investors	Company	Yes	Yes	Quantitative	Multi Topic	Disclosure	Tool
SDGs	Platform	No	Yes	Yes	No	No	Consumer, Corporate, Stakeholder, Governance, Society	Company, Country	Yes	Yes	Quantitative	TBL	Standard	Report
THRIVE Platform	Platform	Yes	Yes	Yes	Yes	Yes	Consumer, Corporate, Stakeholder, Governance, Society	Creature, Company, Community, City, Country, Continent, Cosmos	Yes	Yes	Quantitative	Multi Topic	Standard AND Self-defined	Platform

FIGURE 2. ILLUSTRATIVE CONSOLIDATED COMPARISON TABLE BETWEEN APPROACHES TO SUSTAINABLE ENTITY MODEL INNOVATION STRATEGIES.