Assessing sustainability reports based on Quality Management principles – a preliminary review

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Abstract

Purpose. In order to improve we must be able to measure and understand the results. Sustainability reports could be viewed as organisational measurements of sustainability performance. The quality of sustainability reports could be assessed based on how well they capture core sustainability aspects and how well performance is communicated. This work is a preliminary review discussing how sustainability reports are measuring and communicating sustainability and how this could be rated and improved when using Quality Management principles.

Methodology. Quality Management principles have been used to propose how sustainability could be reported with focus on core aspects and core information needed for the reader. Third year quality management students in a sustainability course have assessed publicly available sustainability reports. Separately, the author, using the proposed sustainability report rating logic, has assessed the same reports. The results are compared and discussed with the purpose of highlighting improvements for sustainability reports and improvement for critical reviews of sustainability that, among others, students could use.

Findings. The indication is that sustainability reports are not easy to interpret. The word sustainability aspect should be defined more clearly, which could be done with focus on People and Planet needs. Guidelines for analysing reports could be improved using process and customer needs focus.

Practical implications. The results form a good basis for further development of sustainability reports and the critical review of them.

Originality/value. The paper discusses a field of synergies between quality and sustainability management, which is important but still sparingly researched.

Keywords
Sustainability Reporting; Quality Management; Principles; Higher Education; Sustainability Assessment; Student learning.

1. Introduction

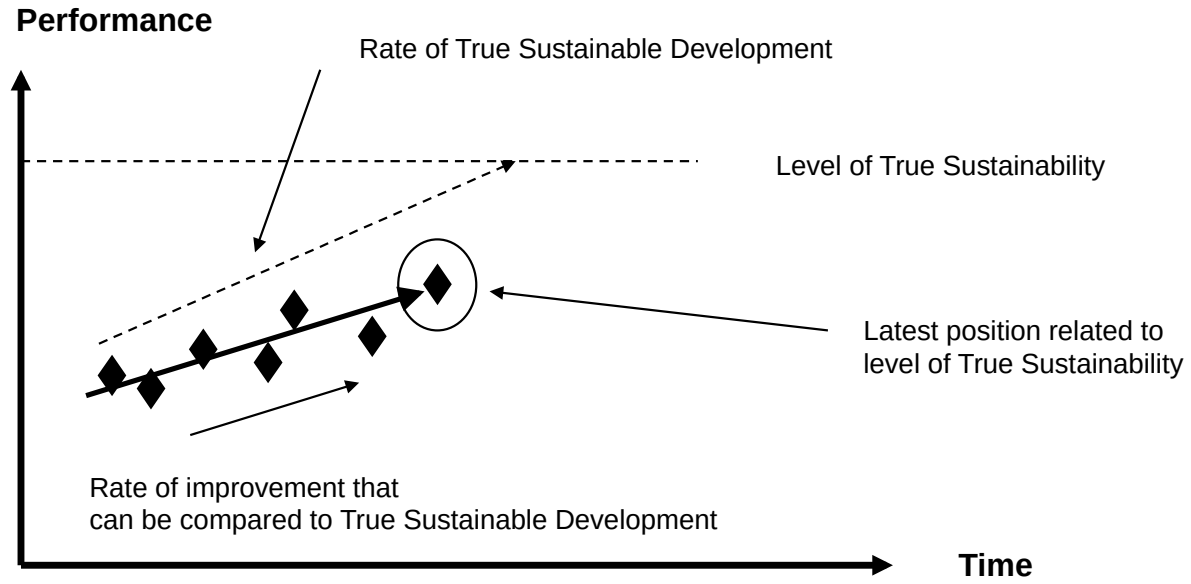
Sustainability reporting has in later years become a necessity for most companies. In Sweden, starting 2017, it is mandatory for larger companies to prepare sustainability reports (SWEL, 2016). Larger is defined as having more than 250 employees or having net sales of more than 350 MSEK (about 30 M Euro). The obvious purpose is to encourage companies to intensify their work with sustainable development. This indicates that the number of sustainability reports will grow. There will be more data to assess for all those working with organisational improvement.

The purpose of a sustainability report is to provide information for interested parties of how the reporting organization is working with sustainable development. Customers for reading the report could be such as interested citizens, investors, employees working with organizational development and students. Students should be able to read the reports and it should be possible for them to understand how the company is doing in terms of sustainability and how it works to become sustainable. This means that relevant information for important sustainability aspects is presented in such a way that the reader can grasp it. Aspects could be seen as areas that relate to global problems as defined by the Sustainable Development Goals (SDG) in the UN Agenda 2030 (2015). More detailed aspects within the environmental dimensions could be listed based on the Planetary Boundaries framework (Rockström et al. 2009).

Sustainability is often described with the Triple Bottom Line of People, Planet and Profit, based on the logic that in order to take care of environmental and social issues prosperous companies and organisations are needed. Since we currently on a yearly basis are globally consuming the equivalent of the production of 1.7 globes there is a system problem (GFN, 2017). This problem might be difficult to solve with incremental methods often consisting of "business as usual approaches" with some additional concern given to environmental and social issues. It might be necessary to look at sustainability based on the main stakeholder needs on a global level from a strictly fact based perspective. This would most likely influence how sustainability is reported.

Asking the question of which the end customers are and what needs they have could form a start of applying Quality Management principles on the global level. Isaksson et al. (2015) suggest that humanity and nature or People and Planet could be seen as end customers. Focus is on mankind but also on nature, if not for other reasons than for guaranteeing eco system services and the continued and improved wellbeing of humanity. With this reasoning Profit becomes a means to an end. The principle of decisions based on facts requires that sustainability be translated into a measurable state that can continue existing without consuming the resources it is based on. The target level and the current performance with speed of progress are needed for decision makers on all levels. Sustainability reports should support good performance management. From my point of view as a reader I would want to see the current level and the progress presented graphically as suggested in Figure 1.

Figure 1. Performance as function of time with a description of the current level of sustainability and progress towards sustainability for relevant indicators.



Source: Isaksson and Steimle (2009).

The scope of the organisational process chosen is important. In a system thinking perspective the entire supply chain should be considered. The process approach could be used to define the scope of the sustainability report. Companies are part of supply chains and therefore also need to take responsibility for the aggregated footprint. When for example Coca Cola Sweden (CCS) reports on their water use but limits it to its Swedish facilities it is both logical and misleading (Coke, 2016). The company reports what they directly are responsible for, but by promoting soft drinks they are a leading actor and driver in the supply chain. The report briefly mentions that most of the footprint is coming from outside the operations, but figures presented and highlighted are for their own activities only. Process based system thinking could be used to clarify the scope. Quality is about doing the right thing in the right way and the quality of a sustainability report could be seen as reporting relevant aspects in the relevant scope. Doing it the right way includes showing current performance and predicted improvement towards a scientifically defined target, as schematically described in Figure 1.

Current reports, often referring to the Global Reporting Initiative guidelines (GRIG4, 2015), do not seem to have any clear focus on customer value. This could affect the easiness of report assessment. If reports are hard to interpret then their role as part of sustainability performance management is diminished. Sustainability issues are complex and might require a relatively high educational level and a broad understanding of improvement work and sustainability. It therefore is important to focus on the clarity of presentation.

RQ1: How could sustainability reporting be assessed based on Quality Management principles?

RQ2: What sense can educated readers make out of sustainability reports?

RQ3: How could introduction of quality principles support the preparation and assessment of relevant and easy to read sustainability reports?

2. Methodology

This work starts with a narrative based on the study of a student assessment of the sustainability work of Coca Cola (Coke, 2016). Both the student report and the company sustainability reporting is studied in detail to highlight typical challenges such as lack of critical thinking and lack of clarity in reporting. Observations from this study are used as input to RQ1 and RQ2 as a first iteration of discussing the improvement of sustainability reports based on Quality Management principles. The main quality principles used in the review are customer needs focus, the process approach and decisions based on facts. These are all part of core Total Quality Management as defined by Bergman and Klefsjö (2010:418). Additionally the Pareto principle or the 80:20 rule is used to identify critical sustainability aspects.

Based on inductive work with roots in Quality Management principles important components for sustainability reporting have been proposed and summarised. These results are then used to study 9 sustainability reports. The reports studied were the same that students had chosen for their analysis. The results provide input for answering RQ1. Third year quality management students in a course dealing with synergies between quality and sustainability have assessed publicly available sustainability reports with the purpose of assessing the level of company sustainability. A rating system is proposed for assessing the student work. The rating is based on the logic of doing the right thing in the right way. This is described in further detail in connection with the results. As a preliminary work 9 individual student reports out of a total of about 50 have been studied and their findings assessed. These 9 reports were representing all students in one sub-group of campus engineering students. The interpretation of the student answers provides a first indication of how easy it is to make sense of sustainability reports - RQ2. Sweden is a country with high ranking in several sustainability ratings and is rated nr 1 in the study from RobecoSam (2017). Generally the level of understanding sustainability in Sweden could be seen as relatively high. This makes it relevant to study the interpretation of reports in the Swedish context. Third year Swedish Quality Management students with a previous course related to sustainable development and Corporate Social Responsibility of 10 ECTS (1/6 th of a full year) could be considered to be educated readers well above both the Swedish national and global average level. This implies that these students should be able to make sense out of sustainability reports. The assessment of the results from the author's rating of sustainability reports and student work is used for answering how Quality Management principles could support sustainability reporting – RQ3.

3. A first review of a sustainability report and its assessment

The choice of the pilot study using Coca Cola Sweden (CCS) and Coca Cola European Partners (CCEP) was chosen randomly. This was the first student report studied. Coca Cola is a large organisation that should have all competence and resources needed to do a good sustainability report. An important aspect for CCEP is the water footprint (CCEP, 2016). In addition carbon emissions are always important. The company prepares several reports. The one chosen by the student is a report focusing on Sweden. It is relatively short with its 12 pages, but it still could be expected to give a fair picture of the situation. The report, which is written in Swedish has a headline saying: "Sustainability is not an end goal – it is a trip from good to better" (Coke, 2016:2) This could be interpreted, as a statement that CCS already is sustainable but still making things better - an interpretation, which could be very far from the truth and signalling greenwashing. The report highlights the water footprint within the company process describing how the goal is to go from 1.5 litres per litre of soft drink to

1.2 litres. When reading the report thoroughly the information of ingredients making up 80% of the footprint can be found. This would mean 7.5 litres of water per litre of drink. However, this still does not give the full picture. When the more extensive report for CCEP in English is studied the fact sheet presents the figure of 70 litres per litre of drink for the full water footprint (CCEP, 2016: factsheet 05/34). When studying the figure highlighting different footprints (CCEP, 2016: factsheet 04/34) this indicates that the reported footprint is only about 1% of the total footprint, which would mean 150 litres per litre of drink. General references for the water footprint present the total footprint of soft drinks as 150-300 litres per litre (EC, 2017). The reader is presented with information of a water footprint from 1.5 to 150 litres per litre of product. This in itself is confusing. The assessment of the level of sustainability is further complicated by the lack of reference to what the true level of sustainability is and how that affects the company. How bad is a water footprint of 150 litres for a litre of drink? Well, it depends of how much water is available for consumption. This again is to a great extent a local issue. The CCS report mentions that sugar is grown in Southern part of Sweden where irrigation is not used. Rockström et al. (2009) present the limit for safe freshwater use at 4000 km3 of water per year and the current use at 2600 km3. Using the current level of global population of 7.5 billion people (Populationpyramid, 2017) with the current consumption as per 2009 this translates roughly into 350 m3 of freshwater per year and person. Assuming that the referred figures of 70-150 litres of water per litre soft drink relate to freshwater this translates to about 2-5 m3 per capita in Sweden of water corresponding to drinks produced in the Swedish CCS facility in Jordbro. This is about 0.7-1.5% of the average calculated freshwater consumption. However, this is only the average for a person drinking 0.5 litres of CCS products every fifth day. The conclusion is that soft drinks might have a measurable impact on the water footprint. This is something that is hard to interpret in the sustainability report, especially in the Swedish version, but also in the more comprehensive English version. The student that analysed the Swedish report only, failed to identify water consumption as an important aspect. The Coca Cola sustainability reports could have been improved by comparing the calculated footprint for the supply chain to relevant units with the Swedish footprint and the targets for it. Generally identifying the main aspects and relating them to system targets on regional or global level would make it easier for the reader to assess the level of sustainability.

The water footprint is an example of the environmental or Planet limits. Another example is the carbon footprint. In the Swedish CCS report the production related emissions are reported as 11161 tons of CO_2 per year. Unclear if this is CO_2 or CO_2 equivalents. The values for CO_2-eq. are normally about 20% higher and include all greenhouse gases (EPA, 2017). From the CCEP report it can be found that production related CO_2-eq. are about 29% of the total emissions in the supply chain. Translating this to the Swedish case would make the total about 38 500 t CO_2 per year. Since these emissions are also produced in other countries it is relevant to compared with consumption figures, which for Sweden are about 100 Mt of CO_2 eq. per year (NV, 2017). This indicates that only 0.04% of the carbon footprint comes from CCS products. The targets for reduction are set to correspond with Scientifically Based Targets (SBT, 2017) and seem to correspond with overall reduction requirements, provided all businesses have to reduce the same amount. For CO_2-emissions like for the water footprint it is not easy to put the improvement work into the Swedish or global contexts.

For the People or social indicators there are many options. The CCS report mentions charitable actions carried out, but also work in reducing the sugar content in products.

Obesity and over consumption of sugar is a problem in Sweden and could therefore be seen as a relevant aspect. What I as a reader would have wanted to see is how much sugar is reasonable for me to consume without problems and how much is provided by the average drink. The CCS report refers to World Health Organisation (WHO) writing that no more than 10% of the daily calorific intake should come from sugar (Coke, 2016). There is also a commitment to reduce the calorific content of drinks with 10% by 2020 compared to a 2010 baseline. However, what is missing is the explicit calculation of what the safe limit of consumption is in terms of amount of sugary drinks when respecting the WHO limit. The number of drinks to be safely consumed could be seen in function of the sugar content.

A key profit indicator according to GRIG4 (2015) is the EC 1: "Direct economic value generated and distributed". This cannot be found in the two sustainability reports studied but is reported in some separate document. The sales value is of interest for assessing the Profit/Planet indicator of US$ of sales per ton of carbon emissions. This measures the carbon intensity of the business and can then be compared with customer needs value produced. The logic being that the more needed the product is the more of carbon emissions could be permitted and the opposite. At the global level the carbon intensity calculated as world GNP per carbon dioxide emissions is about 2500 US$/ton of CO_2 (Isaksson et al. 2015). Using information on CCS sales volume in litres (Coke, 2016) and the carbon footprint from this together with the sales value (Allabolag, 2017) results in a ratio of 10000 USD/ton CO_2. This shows that the company produces value well above the average. However, since carbon emissions need to be reduced, the average ratio needs to increase considerably, possibly up to 20 000 – 60 000 US$ per ton of CO_2 by 2050 (Isaksson et al. 2015). Also, if reduction requirements would be differentiated depending on the customer needs value, requirements could be higher for CCS than for the average company. For any company it should be of importance to report the carbon intensity and its development compared to a goal defined by external requirements.

When considering people as the main customer there should be a clear customer needs focus. These needs could be classified using the Maslow hierarchy of needs (Maslow, 2017). These needs are described from lower to higher as: Physiological, Safety, Love/Belonging, Esteem and Self Actualisation. Soft drinks would in most cases end up in the level of Belonging, Esteem and possibly Self Actualisation when accepting the marketed image. In some rare cases with lack of clean drinking water, canned soft drinks are satisfying Physiological needs.

Drinking soft drinks drives the water footprint while satisfying customer wants but seldom their needs. Instead, drinking sugary drinks increases the risk of obesity. This means that the business idea has a problem in promoting products that are not needed. The company could therefore expect that possible taxes or quotas for CO_2 could disfavour products that are higher up in the Maslow hierarchy of needs.

Table 1. The global goals for sustainable development with general descriptions. Underlined text describes goals that are identified as potentially important for Coca Cola.

The global goals for sustainable development	General description
1. No poverty	End poverty in all its forms everywhere
2. Zero hunger	End hunger, achieve food security and improved nutrition and promote sustainable agriculture
3. Good health and well-being	Ensure healthy lives and promote well-being for all at all ages
4. Quality education	Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
5. Gender equality	Achieve gender equality and empower all women and girls
6. Clean water and sanitation	Ensure availability and sustainable management of water and sanitation for all
7. Affordable and clean energy	Ensure access to affordable, reliable, sustainable and modern energy for all
8. Decent work and economic growth	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all
9. Industry, innovation and infrastructure	Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation
10. Reduced inequalities	Reduce inequality within and among countries
11. Sustainable cities and communities	Make cities and human settlements inclusive, safe, resilient and sustainable
12. Responsible consumption and production	Ensure sustainable consumption and production patterns
13. Climate action	Take urgent action to combat climate change and its impacts
14. Life below water	Conserve and sustainably use the oceans, seas and marine resources for sustainable development
15. Life on land	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss
16. Peace, justice and strong institutions	Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels
17. Partnerships for the goals	Strengthen the means of implementation and revitalize the global partnership for sustainable development

Source: Agenda 2030 (2015).

Seen from the perspective of the Pareto Principle, which would be the vital few aspects that are important for CCS? The entire supply chain from raw materials to end-use should be in focus. The Sustainable Development Goals can be used as a checklist to highlight important aspects. In Table 1 some aspects have been identified as potentially important. The CCS report identifies specifically water, climate, energy and health as important areas to work with. The goal 14 life below water, identified in Table 1, relates to the problem with plastic pollution of oceans, which relates to recycling of packaging. This is mentioned in the report under energy efficiency. On the overall level the CCS report takes up the right things according to Agenda 2030, those aspects that are important for the company. The area missing, based on earlier discussions, is presenting the customer value that the business produces and how the economic value created compares with harm produced such as the carbon and water footprints. This is outside of the requirements of the GRI guidelines (GRIG4, 2015), but is still important and could indicate an area of improvement of these guidelines.

From the review done, water, climate, health and the specific value created per main harm could be seen as the most important aspects for the company. The student answer does not clearly summarise these. One problem has been the interpretation of aspect, which was not clear. Another problem is that customer value has not been discussed as being part of the economic sustainability. Here, the question presented needs to be improved in such a way that it becomes clear that what is sought for are the core sustainability areas for the company and that company value production needs to be assessed beyond the monetary value created.

The scope of the CCS report is on the footprints generated in Sweden. When reading the report thoroughly references to the more extensive CCEP report can be found where the entire supply chain is clearly presented. However, the CCS report could easily be interpreted as showing a situation of sustainability, even for the water footprint where there is still a lot to do. The student answer indicates that the entire supply chain has not been considered and that it has not been understood that the water footprint is important. This indicates that the scope is not clearly mentioned in the CCS-report. Clarity of scope for the sustainability report is important and is part of doing the right thing.

Doing the thing right is interpreted as presenting the performance in comparison with a target as described in Figure 1. The CCS report presents a table with results from three consecutive years, which gives an impression of the rate of improvement. Some goals are presented, but how they have been derived is not clear. In most cases they seem to be self-referential and not linked to external system requirements, which could be a common problem (Haffar and Searcy, 2016). In the larger CCEP report a reference is made to Scientifically Based Targets for the carbon emissions (SBT, 2017). The clarity of the situation compared to a target could still be considerably improved. The sustainability targets that the student proposes indicate that it is not clear what constitutes sustainability for the studied company.

4. Sustainability report assessment with the support of Quality Management principles

Logically there should be significant synergies between quality and sustainability management. Both disciplines strive to improve performance in organizations. There are apparent synergies but it seems that many of these are still not realized (Vanajah et al. 2016).

The main stakeholders, who also could be seen as customers, are defined as People and Planet. A customer is defined as the one whom value is created for. Sustainability thus becomes a state where the needs for People and Planet are catered for without consuming any non-renewable resources. In order to achieve this, Profit is needed with focus on user value created. The definition for sustainability from The Natural Step (TNS) can be used; "In order for society to be sustainable, nature's functions and diversity are not systematically subject to:

I. increasing concentrations of substances extracted from the Earth's crust;

II. increasing concentrations of substances produced by society;

III. physical impoverishment by over-harvesting or other forms of ecosystem manipulation; and

IV. resources are used fairly and efficiently in order to meet basic human needs worldwide." (Robèrt, 2000).

Core sustainability aspects could be derived from above.

The first three requirements relate mainly to Planet and the last one to People.

4.1 Doing the right thing – identifying core aspects and setting the scope

With focus on People the important thing to focus will be on customer needs. Customer wants should be listened to but in systems with limited resources customer needs should be in focus. This means that economic sustainability or Profit should be redefined. The requirement of profit and its fair distribution mentioned in the GRI guidelines (GRIG4, 2015) should be complemented with some type of utility that describes customer needs satisfaction.

In the GRIG4 (2015:7) aspect is described as: "At the core of preparing a sustainability report is a focus on the process of identifying material Aspects – based, among other factors, on the Materiality Principle. Material Aspects are those that reflect the organization's significant economic, environmental and social impacts; or substantively influence the assessments and decisions of stakeholders".

The sustainability definition focuses on outcomes for Planet and People. Using the Quality Management principle of "Focus on process" to delimit the system studied, could help to reduce the number of core aspects. Isaksson (2015) proposes to divide results in output and outcome where output is the result of the process and outcome is the stakeholder satisfaction. With focus on the stakeholders Profit, People and Planet and impact on these within the context of the relevant supply chain, the definition of aspects could possibly be narrowed down. The question asked is, what is essential for stakeholder satisfaction? Discussing the main drivers of stakeholder satisfaction in a business process perspective could be described as in Table 2.

Based on the five Quality approaches defined by Garvin (1984), performance could be seen from a user based approach, here translated to a stakeholder approach, which describes the level of satisfaction of different stakeholders when comparing to main needs and wants.

Garvin (1984) also proposes a value based quality approach, which compares value to the cost of it. This could be translated more generally to a relative indicator described as value/harm (Isaksson et al. 2015). In Table 3 some value-based indictors derived from Table 2 are proposed.

Table 2. Structure for categorising important sustainability aspects for level of satisfaction

Stakeholders Satisfaction Aspect (outcome)	Profit	People	Planet	Comments (principal sustainability dimension)
Economic performance	Shareholder wants and needs			Return on Investment (ROI) is an example of the economic performance
Salary		Employee		
Taxes		Society		
Utility		Customer wants and needs		Wants could be negative like in the case of sugary drinks
Price	Shareholder	Customer		Conflict of interest
Environmental footprints			Ecosystems globally and locally	State of nature instead of satisfaction
Effort, time and risks		Employee Citizen		Human time and effort
Social footprints		Citizen wants and needs		Needs would be such as health and wellbeing that could be defined using Maslow's hierarchy of needs

Source: Prepared by author

The results in Table 3 should be considered as a first iteration based on the Pareto principle and applied on the main stakeholder aspects. Focusing on the main value and harm created reduces the number of aspects at this level considerably. In GRI there are a total of 46 listed aspects, which seem to be a mixture of input, output, resources and outcome. One of the four economic aspects is: Procurement practises", which could be seen as a method resource for controlling input (GRIG4, 2015). This is neither a bottom line nor an outcome. There are twelve environmental aspects out of which "Biodiversity" is an outcome, "Emissions" is an output and "Supplier environmental assessment" is a method resource to control input. There is a similar mix of different types of aspects within the 30 social aspects. There seems to be an advantage in using the process logic in order to focus on outcome aspects. With a process approach that focuses on outcome and that employs a Pareto principle it should be possible for any company to reduce the number of critical aspects to a number which is both manageable and relevant for sustainability performance reporting.

Table 3. Proposed core relative sustainability indicators for main aspects with some examples using Coca Cola

Stakeholders	Sustainability indicator	Sustainability indicator example
Value/harm (business)	Economic performance/ footprints	Sales value/carbon and water footprint, safety & health
Value/harm (employee)	User needs satisfaction/ price; Salary/Effort	Wellbeing/price; Salary/ working time and level of safety & health
Value/harm (citizen and society)	User needs satisfaction/ price and footprints; Taxes paid/footprints	Wellbeing/price, carbon and water footprint and safety & health; Amount of taxes/water and carbon footprint and safety & health
Value/harm (nature)	Increase of natural resources/price and footprint	Cleaning of beaches engaging young people/price (cost) and footprints

Source: Prepared by author

Another important part of the right thing is to choose the scope of reporting. Most companies are part of supply chains and would therefore need to have an understanding of the entire supply chain performance in addition to the company specific performance. Like with the example of Coca Cola, it is the consumption of the soft drink that drives sugar production and the entire supply chain water footprint. Both the water and carbon footprint should be reported for the core process studied and for the entire supply chain.

4.2 Doing the thing right – managing sustainability of the main aspects

Doing the thing right could be seen as working with the critical aspects for which descriptive science based targets are identified for the organisation. Relevant Key Performance Indicators that should include both absolute and relative figures need to be established.

Isaksson (2015) suggests working with Opportunity Studies where a virtual benchmark is created based on what the system can or must be able to do. Using the TNS sustainability definition as a reference to be compared with the current performance will establish the improvement potential or the improvement necessity. The timeframe of the change required could be set in such a way that Planetary Boundaries are not exceeded (Rockström et al. 2009). Applying Backcasting (Robèrt, 2000) from the defined state of sustainability to current operations based on the time available should make it possible to explicitly present the target performance as schematically described in Figure 1. That is, each company should be able to identify the "vital few" critical aspects and define Key Performance Indicators (KPI) that are linked to long-range goals and a targeted rate of change.

5. Rating and assessing sustainability reporting

Here, the reasoning from above is converted into a preliminary model for rating sustainability reports. Furthermore nine sustainability reports are assessed and in parallel the student assessments of these reports are studied.

5.1 Rating of sustainability reports

For the right thing the two important assessment criteria are identifying the scope and the choice of core aspects for the organisation.

Doing the thing right is based on the choice of indicators, the presentation of them and the target chosen. Important issues are how current performance is reported, how the targets have been set and the timing of these targets. Essentially a presentation like that in Figure 1 should be found for top performance. All questions are rated from a scale 1 to 5 with 5 indicating the highest level of measurement performance. For each criterion statement the rating is defined as follows:

1 Not true
2 Mostly not true
3 Equally true and not true
4 Mostly true
5 True

See proposed rating in Table 4.

Table 4. Proposed scale for rating sustainability reports based on doing the right thing and doing it the right way

Statement	Comment
Clear link from chosen priority to regional and global relevant and critical aspects	Right thing
The entire supply chain and life cycle are used as scope	Right thing
Appropriate KPIs that describe current performance for relevant main aspects including relative value per harm indicators	Right way
Indicators for main aspects present the position compared to the target level	Right way
Indicators for main aspects present the development indicating how a level of sustainability will be achieved	Right way

5.2 Rating of student work

Students were free to choose any company with production of goods for their analysis and were told to choose different companies.

The student work is rated based on how well the student has independently identified the core aspects and how well appropriate measurements are understood. The core aspects, identifying the right thing, are analysed by studying the answer to the question: "Identify most important sustainability aspects and assess what should be the most important aspect based on sustainability theory". Additionally, even if not explicit in the question, the student assessment of the scope has been evaluated. Has the student identified that the supply chain needs to be assessed. The questions: "Describe how sustainability is measured in the report and propose additional indicators" and "Propose objectives that the company should achieve by 2050" are used to assess how the student has interpreted doing the right thing.

5.3 Assessment of sustainability reports

The quick review and rating indicate a generally low level compared to the quality principles derived criteria.

Table 5. Rating of nine sustainability reports based on Table 4 carried out by the author

Report	Pages	0=Not mentioned; 1=inspired by GRI; 2=according to	Clear link from relevant priority to regional and global aspects	The entire supply chain and life cycle are used as scope	Appropriate KPI that describe current performance for relevant main aspects including relative value per harm indicators	Indicators for main aspects present the position compared to the target level	Indicators for main aspects present the development indicating how a level of sustainability will be achieved	Average
Coca Cola	12	2	4	3	2	3	3	3
Arla	68	1	2	2	1	1	1	1.4
Arvid Nordqvist	16	0	3	4	1	1	1	2
Cloetta	52	0	2	2	1	1	1	1.4
Findus	21	2	3	2	1	1	1	1.6
Nestlé	351	2	5	5	4	1	2	3.4
SCA	76	2	2	1	1	1	1	1.2
Scania	124	2	1	1	1	1	1	1
Volvo	204	1	2	1	1	1	1	1.2
Average	103	1.3	2.7	2.3	1.4	1.2	1.3	1.8

Focusing on the right thing receives a higher rating (2.5) than doing the work in the right way (1.3). The problem with the right way is clearly defining science based targets and relating them to the supply chain. Generally it is very difficult to get a fact-based picture of where the studied company is compared to a defined level of sustainability.

5.4 Assessment of student understanding of the sustainability reports

The results in Table 6 show that students have struggled with understanding what is reported. The first two questions relate to doing the right thing and the two others to doing the thing in the right way. Critically analysing what the right things to report are has been very difficult. Only one of the students assessed has been able to show some logical and critical thinking in assessing which the main aspects are. Where more could have been expected, is in judging how performance should be reported. Here, there are a few students that have proposed what has been judged as relevant targets.

Table 6. Author rating of how students have interpreted nine sustainability reports

Report	Pages	Correct identification of aspects	Supply chain has been noted	Understan-ding indicators	Relevance of targets proposed	
Coca Cola	12	1	1	1	2	1,3
Arla	68	1	1	1	2	1,3
Arvid Nordqvist	16	1	1	1	1	1,0
Cloetta	52	1	1	1	1	1,0
Findus	21	1	1	1	2	1,3
Nestlé	351	2	1	2	2	1,8
SCA	76	1	1	1	1	1,0
Scania	124	1	1	1	1	1,0
Volvo	204	1	1	1	1	1,0
Average	103	1,1	1,0	1,1	1,4	1,2

Source: Prepared by author

6. Discussion and conclusions

The purpose of this work was to assess how quality management principles could be used to assess sustainability reports. The work has a wide scope and covers many areas superficially. The intention here is to present a first idea of the approach using QM principles. Three research questions were formulated. These are discussed and concluded below.

6.1 How could sustainability reporting be assessed based on Quality Management principles?

Issues discussed have been focusing on the end customers, which have been identified as People and Planet with the organisational scope being the entire supply chain. Doing the right thing consists of identifying the vital few critical aspects in the supply chain that have global or regional relevance for the main stakeholders. Important stakeholders in the People group are customers and citizens. Important Planet stakeholders would be those eco system services that are required for humanity and nature to thrive such as the atmosphere and the biosphere. Stakeholder concern for People would be wellbeing and health with priorities given based on

the Maslow's hierarchy of needs. Stakeholder concern for Planet can be assessed based on the planetary boundaries (Rockström et al. 2009). The indicative aspect of good reporting, that all companies should have a good presentation of, is climate. This is potentially always an aspect. In Table 7 a summary of the proposals is presented with comments to differences with current reporting based on the GRI guidelines.

The conclusion is that the initial work is promising. Sustainability reports could be improved significantly by focusing on what is important and by clearly demonstrating performance compared to sustainability targets. Further work needs to be done in clearly identifying the critical customer needs for People and Planet.

Table 7. Summary of proposals for assessing sustainability reports based on Quality Management Principles

<table>
<tr><th>Component</th><th>Main stakeholders</th><th>Examples of main stakeholders</th><th>Aspects</th><th>Comments</th></tr>
<tr><td rowspan="7">The right thing

What is important for the company in relation to global focus areas</td><td>People</td><td>Customers</td><td rowspan="2">Health and wellbeing with focus on those that are needing it most</td><td rowspan="5">The GRI guidelines propose a total of 46 aspects, which are a mixture of input, output, outcome and resources. With focus on end customers needs and by defining critical aspects as customer outcomes the number of critical aspects to assess could be considerably reduced</td></tr>
<tr><td></td><td>Citizens</td></tr>
<tr><td>Planet</td><td>Atmosphere</td><td>Climate</td></tr>
<tr><td></td><td>Bioshpere</td><td>Biodiversity</td></tr>
<tr><td></td><td></td><td>Freshwater</td></tr>
<tr><td></td><td></td><td>Land system change</td><td></td></tr>
<tr><td>Profit</td><td>Customers
Companies</td><td>User and other stakeholder value/harm</td><td>Profit is seen as a means to an end where the company providing most user needs value per harm will retain its license to operate
In GRI the economic sustainability consists of economic value generated and distributed</td></tr>
<tr><td>The right thing

Focus on the supply chain</td><td></td><td>Customers
Companies</td><td>User and other stakeholder value/harm</td><td>This is mentioned in the GRI guidelines but the indication from the applications is that focus often is more restricted to domains directly controlled by the company possibly leading to difficulties in assessing the real impact</td></tr>
<tr><td rowspan="3">The right way</td><td>Science based targets for the sustainable state</td><td colspan="2" rowspan="3">For all critical aspects of the company</td><td rowspan="3">The GRI directives with the 91 proposed indicators give great freedom for reporting making the interpretation hard.
Requirements on reporting performance only. Clear guidelines on setting goals on sustainability level and rate of improvement towards the goal are missing.</td></tr>
<tr><td>KPI that present the situation compared to target</td></tr>
<tr><td>Trends showing development towards target</td></tr>
</table>

Source: Prepared by author

6.2 What sense can educated readers make out of sustainability reports?

The results were discouraging and the short answer to the research question is – not much! Generally it proved to be very difficult for the third year students to make sense out of the reports. One explanation for this is that the expression sustainability aspect proved to be less clear than anticipated. In the GRI guidelines the following text is found: "At the core of preparing a sustainability report is a focus on the process of identifying material Aspects – based, among other factors, on the Materiality Principle. Material Aspects are those that reflect the organization's significant economic, environmental and social impacts; or substantively influence the assessments and decisions of stakeholders" (GRIG4, 2015:7). "The word topic is used in the Guidelines to refer to any possible sustainability subject. The word Aspect is used in the Guidelines to refer to the list of subjects covered by the Guidelines" (GRIG4, 2015:9). In the course literature a book in Swedish was used. In this the authors had interpreted the GRI aspects as areas describing the Triple Bottom Line structure based on the Triple Bottom Line and then used the Swedish word "aspekt" for vision, structure and activities to form a matrix with the areas (Frostenson et al. 2015). This means that "aspect" and "aspekt" were described as two entirely different things. This could be seen as an indication of unclear definitions for core expressions. This confused some students into totally missing the assessment of what the right thing should be for the studied company.

The preliminary results indicate that even persons well trained in systematic problem solving might still have great problems in making sense of what the main sustainability problems are. One conclusion is that much more work needs to go into making sustainability reports easier to interpret. Another conclusion is that much better directives for analysing sustainability reports need to be presented for students.

6.3 How could introduction of quality principles support the preparation and assessment of relevant and easy to read sustainability reports?

Out of the nine studied companies, seven refer to, or work based on the GRI reporting guidelines. This confirms the dominating role of the GRI guidelines. It could be that part of the complexity in reporting is due to the structure of the guidelines. The GRI listing of 46 aspects could be a complicating issue as well as the 91 listed indicators. The GRI guidelines largely lack process and customer focus, which are two core quality principles. Seeing businesses, as processes would simplify it for the reader to understand which the scope is. Here, Nestlé has the best report presenting clearly a simple process chart describing what is included. Also, Coca Cola has a visualisation of both the company focus and the entire supply chain. These two reports have in the preliminary assessment, received the highest score, see Table 5.

The preliminary conclusion is that current sustainability reporting could be very hard to interpret even for the advanced reader. Reporting could possibly be improved using Quality Management principles for sustainable development by opening up new ways, such as focusing on the vital few customer needs and identifying critical sustainability aspects in the entire lifecycle process.

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