

ISTORM – IDEA AND REFERENCE ARCHITECTURE APPROACHING INTER-ORGANISATIONAL SUSTAINABILITY REPORTING

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Abstract

The paper describes an approach for inter-organisational sustainability reporting. This approach is based on an open source software tool “Sustainable Online Reporting Model” developed at the University of Oldenburg. The idea of sustainability reporting across a single reporting entity like a company originated from the field of financial reporting. Later on Kasperzak (2003) presented an approach in which a network of corporations is treated as a single economic entity with the aim to get an extended consolidated financial statement. This approach is considered to fuel current discussions in sustainability reporting around issues like: Where to set reporting boundaries and how to enlarge reporting entities. This paper is research in progress. First, the idea of inter-organisational sustainability reporting is presented. The focus here is to enlarge reporting boundaries to an inter-organisational entity and to create a sustainability report covering an inter-organisational perspective. Such report from a collective perspective opens a window of new opportunities and provides added value compared to current sustainability reports of single entities. Second, a reference architecture for an “Inter-organisational Sustainable Online Reporting Model” is proposed.

1. Introduction

In recent years, sustainability has become of interest for companies and an emerging research field with new ideas and problems to be solved by companies and universities. Companies as well as researchers are discussing the impact of the demand for environmental information of the public with the focus for companies and resulting research queries at several conferences as for example the “Information Technologies in Environmental Engineering” conference or the “International Conference on Informatics for Environmental Protection”.

Nowadays, corporations are linked via business processes to be more successful on the global market. The further development in information and communication technology allows current corporations’ extensive networking of business processes e.g. global supplier-costumer relation in supply chains or on a local level in an industrial park. The increased exchange of information between corporations by this development is represented in current scientific and business discussions. The possible ways of that communication are shown in figure 1.

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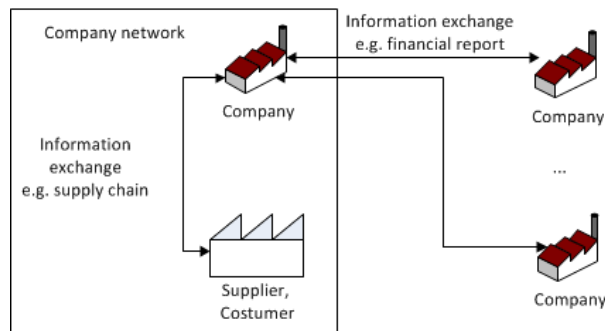


Figure 1
Communication between companies

The environmental impact of products is the sum of the environmental impacts of all parties involved in the business process and related supply chains. The idea of reporting from a network view is borrowed from the field of financial reporting by Kasperzak (2003). Not considering all participants means not assessing the true impact of a product thus resulting in a decrease in transparency of the environmental impact which is reported to the involved stakeholders such as public or non-governmental organizations. A first approach to support a harmonized exchange of sustainability reports was presented at the multi-conference information systems 2008, Munich, by Isenmann et al. (2008). They proposed an extensible business reporting language taxonomy for sustainability reporting. This proposal is a first step which led to further research on sustainability networks and network publicity for sustainability reporting (Isenmann and Marx Gómez 2008, Solsbach et al. 2009, 2010, Solsbach and Schubert 2010).

For example, the Nestlé AG regards the exclusion of information from suppliers and customers by current reporting standards as a drawback. The non-financial report “Der Nestlé-Bericht zur gemeinsamen Wertschöpfung” of the year 2007 (roughly: Nestlé report about the creation of combined added value) by Nestlé AG (2008) describes the environmental impact of Nestlé AG and its wholly-owned subsidiaries using a reduced structure of the Global Reporting Initiative (GRI) guidelines. This report indicates that Nestlé AG aims on one-hand to report from the view of a network (specifically an internal network). On the other hand that report presents an outlook of an extended report for 2010 (no further information about that report until now) considering the full usage of GRI guidelines and extended information to include environmental data of all suppliers and customers.

2. State-of-the-art of sustainability reporting guidelines

The public demand for information in social and ecological aspects in combination with the developments in information and communication technologies in the last decade induced an increased number of social and environmental reports. At the same time the quality of these reports increased by the development of specific guidelines and standards for reports as done for example by the Association of Chartered Certified Accountant (2001) “Environmental, Social and Sustainability Reporting on the World Wide Web: A Guide to Best Practice” or GRI’s (2006) G3 “Sustainability Reporting Guidelines”.

Nowadays, there exist several sustainability guidelines with different levels of granularity to be adopted from companies for their sustainability reporting purposes. The United Nations Global Compact (2010) is based on “ten universally accepted principles in the areas of human rights, labour, environment and anti-corruption” aiming on tasks and processes which are stated in a yearly so-called “Communication on Progress” towards potential stakeholders specified by the company on their own interests. This guideline re-

flects the open range of sustainability reports by allowing companies to insert their vision of sustainability and strategic aims. The SA8000:2008 Standard by Social Accountability International (2008) as a revised version of SA8000:2001 follows this open principle by addressing nine topics which aim to protect the basic human rights of workers such as child labour, forced labour, working hours and so on. That standard has no performance indicator sets as GRI's G3 guidelines (2006) but a detailed guidance document for the 2nd edition of SA8000 published in 2004 (no guidance documents for the 3rd edition of SA8000 published in 2008 until now). The SA8000:2008 Standard and the guidance document for the 2nd edition of SA8000:2004 can be used to develop indicators for a detailed level of granularity. Currently the G3 guidelines are the most frequently accepted guidelines to generate a sustainability report. They describe required environmental, economic and social information of a report on an indicator level. The companies are supported by a detailed framework of indicators (non-qualitative and qualitative) to enhance the clarity and comparability for stakeholders reading a sustainability report that follows these guidelines. The guidelines themselves are suggesting core and additional indicators which are required in different application levels (A-level, B-level, and C-level). In exemplary the report application level C of the GRI G3 guidelines requires at least one indicator from economic, social and environmental and a minimum of ten performance indicators. The C-level demands no G3 management approach disclosures and a list of G3 profile disclosures are mentioned such as 1.1 which is a statement of ten most senior decision-makers (e.g. CEO, chair ...).

3. Inter-organisational sustainability reporting approach

From the scientific point of view, exclusion of information from suppliers and customers is reducing the scope and information value of sustainability reports which needs to be changed by altering the guidelines for sustainability reporting. Currently, sustainability reports as the Global Reporting Initiative G3 guidelines (2006) or the United Nations Global Compact (2000) are not considering environmental information exchanged in whole supply chains or other kind of networks of a company network. Bey (2008) and Lundie and Lenzen (2008) are discussing the scope of current sustainability reporting and the impact of not considering the system boundaries for sustainability reporting. Bey highlights the definition of adequate system boundaries as one major research question to improve the value and acceptance of sustainability reports. Lundie and Lenzen are suggesting a method for a quantitative sustainability reporting – using process- and company data combined with macro-economical and ecological statistics to include the complexity relations of economic activities with economics to rate the sustainability of organizations. This approach aims to benchmark the sustainability activities with competitors, companies from other industries or even the economics of a whole country (Lundie and Lenzen 2008, 100). That differs from our approach which has the focus of increasing information value, transparency and reliability by implementing increased planning and management functionality for an inter-organisational approach of sustainability reporting.

The idea to develop current sustainability reporting towards an inter-organisational approach (see figure 2) is an interdisciplinary efforts and hence makes use of insights of various research fields, among others :

- Finance and Business Reporting
- Environmental Informatics
- Business Information Systems

The current situation of companies, publishing sustainable information on their websites or as printed document, cannot be completely mapped to available sustainability guidelines due to missing indicators and guidelines which currently disregard the organisational structure of companies (not-wholly-owned subsidiaries, joint ventures ...).

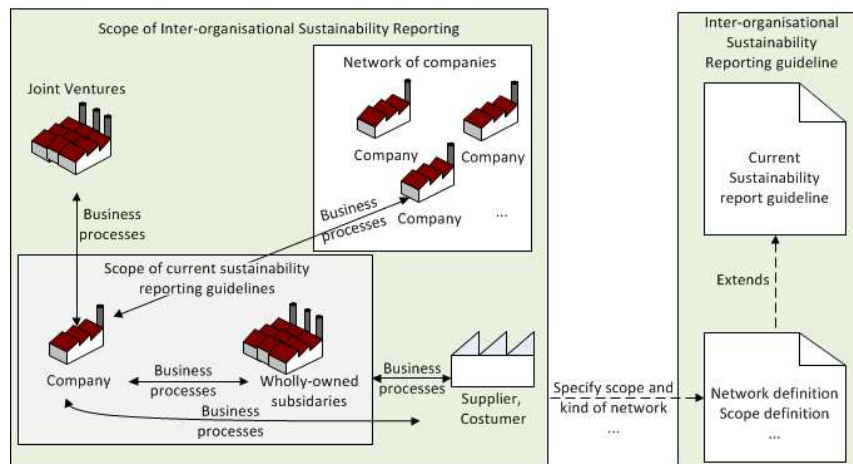


Figure 2
Inter-organisational Sustainability Reporting and requirements for a supporting guideline

First approaches such as in the field of finance with the topic of network publicity (Kasperzak 2003) and communicating requirements (DiPiazza Jr. and Eccles 2002) point out that sustainability reporting guidelines and information exchange requires new approaches to address these topics. The continuative research in the field of business informatics mentioned in the introduction section above with a harmonized extensible business reporting language taxonomy for sustainability reporting (Isenmann et al. 2008) combined with requirements as described by Nestlé AG (2008) are leading us to the presented scope of inter-organisational sustainability reporting (see figure 2). Here companies are connected via business processes such as supply chains with its customers and suppliers and are exchanging information which comprises social, economical and environmental information. Companies are linked via business processes to subsidiaries, joint ventures, customers and suppliers and organize themselves oftentimes as a virtual enterprise which consists of several partners which produce a material or carry out a service. For example company A could provide a raw material for the construction of a product X to company B. They are presenting their product and efforts together as one unit but the environmental impact of the product X will be calculated separately from company B with the information shared by company A as a black box. On the other hand company A will do the same for the environmental impact of company B. This leads to following research questions from our perspective:

- Should not all companies involved in a network which is linked via business processes and which are presenting their products from a network view also present their sustainability activities and the environmental impact of their activities in a uniform way from a network view?
- Are companies able to present current organisational structures of companies with joint ventures and not-wholly owned subsidiaries in one sustainability report supported by current guidelines?

From our perspective there exists a gap between current standards and the requirements from the industry that has to be solved because the current guidelines only give the advice to include e.g. joint venture or subsidiaries into a sustainability report, if they have a direct influence on the reporting company, but without any guideline how this should be done in detail. Addressing these research questions will lead to an inter-organizational sustainability report providing major added-values compared to current sustainability reports.

4. Added-value of inter-organisational sustainability reporting

Inter-organizational sustainability reporting provides new opportunities compared to an approach focused on single reporting entities (see table 1).

Added-values	Action	Treatment in inter-organisational sustainability reporting	Treatment in current single sustainability reporting	Possible risks or open questions of inter-organisational reporting
Information value	Inclusion of joint ventures and not-wholly owned subsidiaries	Indicators and instructions to handle these organisational structures to increase information value	References to increase boundaries without instructions which limit the information value (other companies seen as black box)	Requires definitions to handle financial standards as group accounting Conflict of goals Data security
Information value	Inclusion of suppliers, customers and other companies	Indicators and instruction to handle the network to increase information value	Not covered	Requires definitions to handle financial standards as group accounting Conflict of goals Data security
Management functionality	Using data exchanged from e.g. supply chains	Increased internal management functionality for participating companies	Not covered Companies are seen as black box without detailed information exchange	Data security
Transparency	Presenting stakeholders in an uniform report	Increased transparency for stakeholders by sharing detailed information	Only detailed Information of the reporting company all other information seen as black box	Network partners have to define the level of information exchange
Reliability	Presenting sustainable information from all participating partners	Increased reliability due to elimination of the black box view	Only detailed Information of the reporting company all other information seen as black box	Requires standardization of information exchange between all network partners
Analysis and improvement potential	Analysis and change of processes on all levels in the network	Enabling analysis and changing of processes on all levels between participating partners to increase improvement potential	Analysis and improvement potential only on their own processes	Data security (on process level) which has to be solved by a balance of interests defined in the network

Table 1
Added-value of inter-organisational sustainability reporting
compared to the current approach and its challenges

Table 1 presents added-value as increased information value for an inter-organisational sustainability reporting approach due to inclusion of joint ventures and not wholly owned subsidiaries as information sources. The inclusion of the mentioned companies will overcome the current situation that all external information is seen as coming from a black box without any possibilities to influence them. Current guidelines are not covering the inclusion of suppliers and not wholly-owned subsidiaries which decreasing the reliability and the inter-organisational sustainability approach will enable analyzing of processes on all levels between participating partners.

5. Reference architecture of “inter-organisational sustainable online reporting model”

The reference architecture of Inter-organisational Sustainable Online Reporting Model (iSTORM) extends the reference architecture for dialogue-based sustainability reporting (Süpke, 2010) developed at the University of Oldenburg (2010) and implemented by a group of students (see figure 3).

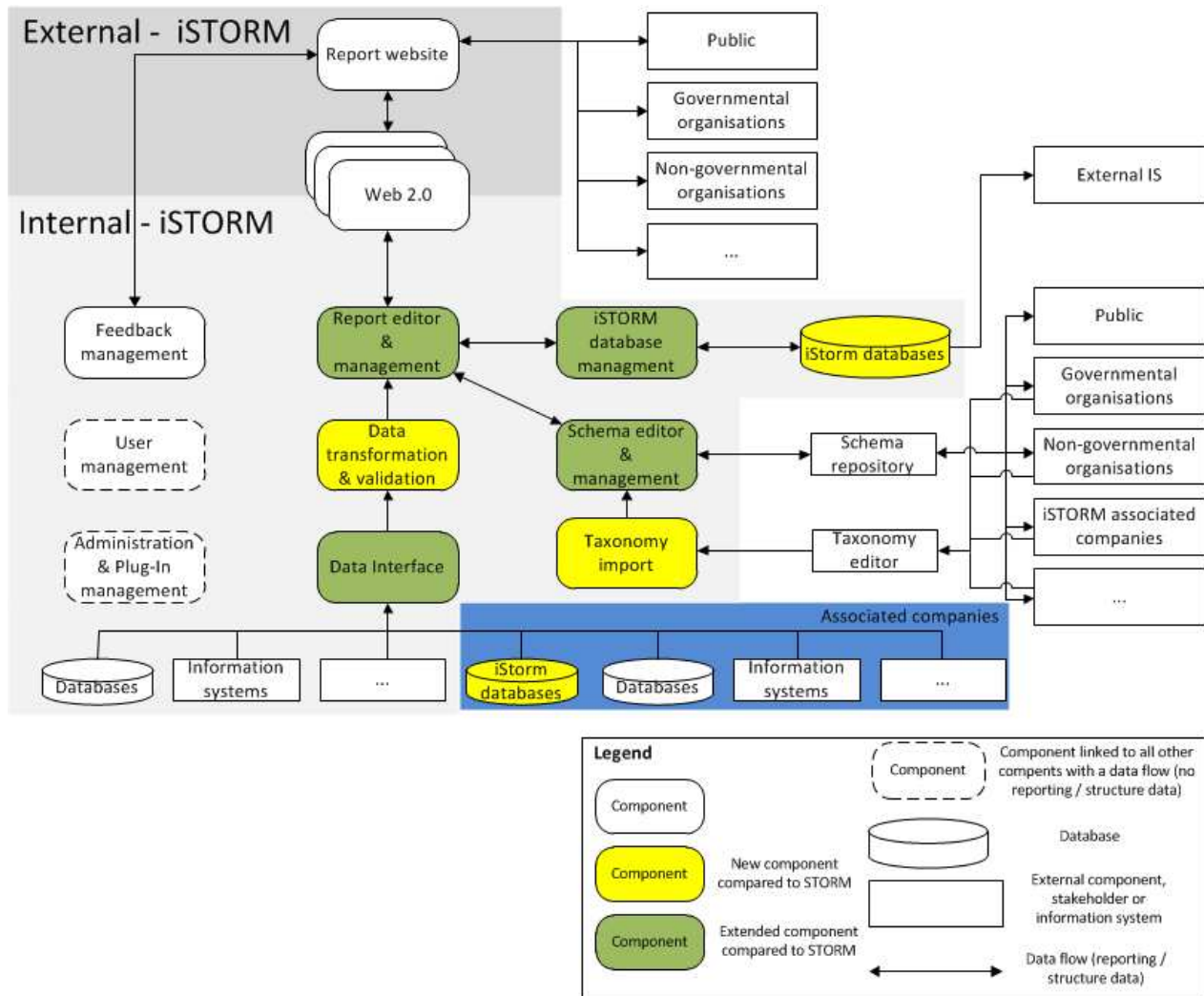


Figure 3
Reference architecture of the inter-organisational sustainable online reporting model

iSTORM extends the existing reference architecture indicated by the yellow and green components. The new components (indicated by yellow colour) are allowing a taxonomy import to improve the semantic information exchange by an uniform data structure. For example, the GRI G3 XBRL taxonomy could be imported into iSTORM and be mapped as a schema for a sustainability report and stored to iSTORM database. The companies' data will be exchanged through the data interface component and saved in an exclusive database for each participant due to data security and performance reasons. The data transfor-

mation and validation component will aggregate that data to a uniform format to be saved in the iSTORM database for every company and one dedicated database for the aggregated data of the whole network. The functionalities of the extended components (green colour) will allow the specific reporting functionalities for an inter-organisational sustainability report. The information of the resulting sustainability report will be accessible in different formats as HTML, XML, PDF and XBRL to be used for internal or external communication and analysis. Associated companies (blue colour) can share their data required for sustainability reporting by accessing databases, information systems such as the iStorm database of an iSTORM implementation of associated companies to generate an inter-organisational sustainability report.

6. Conclusions

The paper presents research in progress dealing with the idea to develop sustainability reporting from an approach based on single reporting entities to an inter-organisation entity. Current gaps of sustainability guidelines and industrial demands to be solved with the help of latest information and communication technologies are pointed out. The excerpt of added-value generated of such a forward-looking approach indicates further opportunities for companies usually involved in different inter-organizational relationships like local networks, supply chains and other forms of industrial symbiosis while competing on a global-scale. The potential added-value is described and made clear on the background of the current approach and reporting guidelines. Further, possible risks and open questions to be considered throughout ongoing research are identified. The paper presents a reference architecture and identifies interfaces for companies' business information systems and databases.

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