EnviroInfo 2011: Innovations in Sharing Environmental Observations and Information

Cataloging and structuring of IT-based methods for the support of sustainable planning and governance in enterprises

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Abstract

Sustainable planning combined with a controlled economical acting are of increasing importance. The environmental commitment also plays an important role, as well as the social orientation of an enterprise. Ideally companies should act economically in a way, that subsequent generations can satisfy their needs in the same dimensions as today's generation, with a permanent profitable, environmentally friendly growth. As companies are confronted with external demands, from stakeholder to NGOs or the public interest, their internal activity has to change the existing behavior to a more sustainable oriented economy. Beside traditional optimizations, focusing on production-optimization or less material usage, many of the activities a company can perform are heavy dependent on the usage of IT-Tools and a hard information layer. In this paper, a first structuring and cataloging of different IT-based methods under the special viewpoint of sustainable planning and governance in enterprises is given.

1. Introduction

As the Internet is widely used within the business, world, new distribution channels are increasing the sales and the growth steadily. Online marketing can be operated economically and yet intense; often there are limitations in the usage on process or business optimizations. Gradually, new techniques of the Semantic Web were moving into the corporate world. The Productivity of a company can be increased with the usage of interactive knowledge management (wikis, blogs …) and geographic information systems (GIS) or decision support systems (DSS) can be used in the visualization as well as the decision-making process. Nevertheless, the potential of these tools is not yet fully exploited.

Concerning the corporate sustainable action plan, there is still a demand for further research and comparison of the mentioned and additional tools, to contribute to an overall sustainable management of current enterprises. Beside special solutions for single sectors or companies, most of the reviewed methods can be applied on much different type of companies, from different sectors as well as from different size or activities. The benefit of the usage of the studied methods can be easily calculated and measured for an internal comparison. Until now, the consideration and survey of it-based methods focusses on singular end-of-activity oriented approaches, like the sustainability reporting (e.g. in Frost et al. 2005). There is, up to today now consideration of it-based methods for the strategically usage of enterprise internal sustainable development.

Therefore, the four different major challenges of corporate sustainability are displayed with connection to the important functional area of a company. The next step is the search for well-known management methods that are needed for an entrepreneurial activity and the development of a structured category system for these methods. The criteria of the system is focused on technological, methodical, functional, ana-

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lytic, communications as well as strategy-type, sustainability challenge, application in practice or functional area. A selection of the reviewed methods will be highlighted in detail and how they can be used for the different challenges of corporate sustainability. Especially the differences between the usage for strict economical used methods and the usage of these methods on sustainable targets will be displayed; highlighting those economic targets can be reached under the procedure of sustainable development with only minor or non-existing disadvantages for several cases.

2. The applicability of strategic instruments for sustainable development

In the surroundings of keywords like Green IT, IT-for-Green or Green Cloud small and medium enterprises, but also bigger, international active companies are starting or already considering the development of internal environmental or sustainable information systems, in order to support reporting activities.

If a company is not able or willingly to take part in environmental policy audit systems or in maintaining complex environmental management information systems, it should still be able to measure the own environmental impact (simply by collecting the legal compliance driven information) and obtain a positive internal sustainable development. Even more, it should be able to calculate or integrate strategic decisions under reconsideration of future activities and plans.

In order to support the development of it-based methods for enterprise internal sustainable development, which guide for an overall Environmental Management Information Systems approach (see Giesen et. al. 2009), a selection of existing instruments has to be done. These instruments are often used under different purposes, especially in the strategic decision making on core enterprises activities some of the mentioned instruments in chapter 3 are already well known to the corporate management. Of new importance, is the transfer of these, economic oriented and used, instruments to a more sustainable viewpoint. By integrating of ecologic and social operating figures and focal points, the usage of such "strategic instruments" can be as well very productive as descriptive, leading on the long-term to a useful way to integrate the goals and targets of sustainable development into the existing (economical-focused) goals of the company. The support through it-based methods for sustainable development and governance in companies will, in this way is reinforced by the re-use of known instruments as well as the concept of adding further goals instead of replacing existing goals. In a later development step, a structured and catalogued collection of (strategically) instruments and it-based methods for the consolidation of a sustainable development inside a company can be extended by the combination with a modular toolbox approach of software system, which helps in different environmental and sustainable related tasks.

By giving such an system to small and medium sized enterprises, but also to bigger enterprises, these companies should be able to execute, accomplish, document and report several key subjects of corporate environmental management. Instead of solving environmental related tasks only out of necessity (particular for legal compliance), such a toolbox will allow small and medium sized enterprises to evolve their environmental management into a holistic and sustainable approach. If these companies will use the selected instruments to target for a sustainable development, instead than only for an environmental protection, that may be simple driven by legal compliance. They may not only be able to reduce their polluting behavior but also to gain additional benefit from long-term oriented development, for instance with optimized operations and improved production by reducing used resources, materials and energy costs. This can be exemplary realized simply by starting documenting and analyzing the actual condition.

In order to archive the strategic integration of sustainable development and to lead to the desired results, the selection of strategic instruments in form of a structured catalog is one of the first steps, which have to be fulfilled. In figure 1, a simple activity flow from company perspective is shown up, structuring the different steps that are connected to the sustainable planning inside of companies. Beside the mentioned instruments, additional (collaborative) planning and project activities with a long-term perspective have to be considered. In a later phase, the selected instruments are considered again, as part of an evaluation and

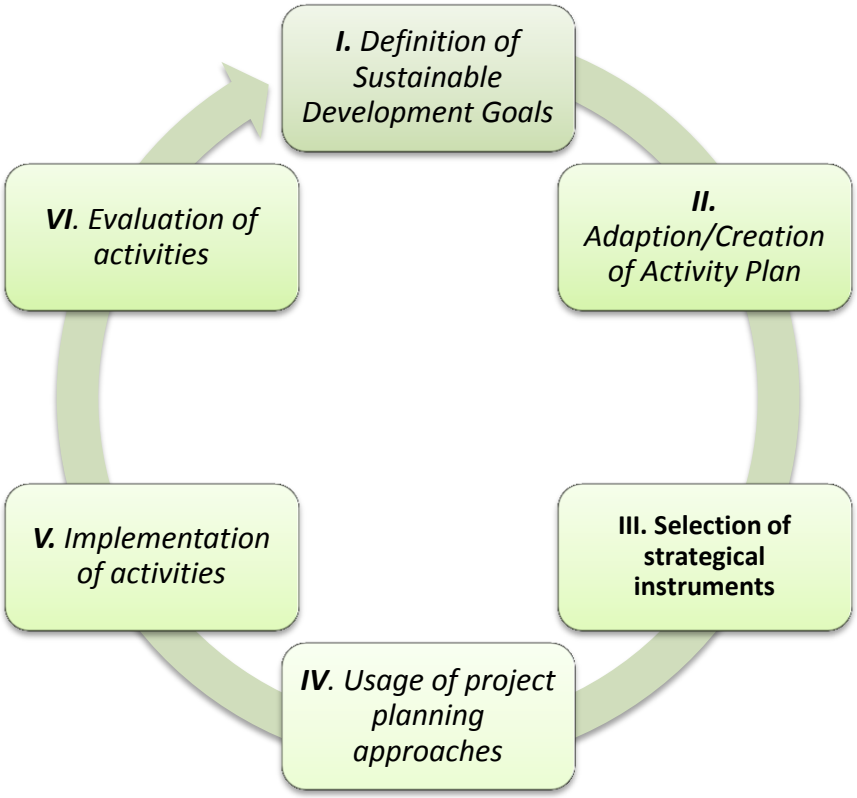

figure 1 – simple activity flow from company perspective
Source: own contribution

reconsideration phase. With such a continuous improvement process, the point of usage of the instruments will be highlighted in periodical timeframes.

The usage of strategically instruments for the enterprise internal usage of sustainable development is one of the primary activities that have to be done, in order to be able to fulfill the activity plan. With a selection of relevant instruments, approaches and methods, in a next phase, the planning of future and current activities can be done under the viewpoint of a sustainable development. One example for such a planning approach can be seen in the collaborative sustainable project planning software system ProPlaNET (see Giesen et. al. 2006 and Giesen/Marx-Gomez 2009)

3. Choice of relevant instruments

In this paper, a tool is defined as an IT based instrument. The term is not set very strictly; it is more a widely adopted term. Tools can be direct, functional and technological but they can also be methodical or indirect functional. Indirect means a tool, which is more a conceptional construct in the first place; however, when it is applied it is going to be realized with the use of IT systems. If the tool can be used for a specific purpose, it is classified as functional. If the tool´s purpose is to combine several other tools to fulfill a greater task, it is classified as a method.

The selection scheme will be illustrated on the two instruments Wiki and early detection. A Wiki is roughly speaking an interactive hypertext system (see Ebersbach et al. 2008, 14). It can be directly used for a specific purpose without any use of other IT systems and additionally it can be used to manage other tools to accomplish a greater task. Therefore, it is classified as a direct functional and methodical technological tool. The application of early detection in a company can be realized with business intelligence software. Thus, it is classified as a conceptional technological tool in indirect sense. In addition, the sustainability management in companies requires the use of tools to successfully face the challenges resulting from environmental, social and economic purposes.

The identification of the tools took place in three phases. Firstly literature was researched to find out where management tools in general have already been mentioned and further been described. In this way are large fund of tools came up which were subjected to a more refined approach in the second phase.

There, only those tools were chosen which have at least in some extent a relation to computer science. A during the selection process eliminated tool for example was the entrepreneurial vision. This is quite a common management tool and can be used within the context of sustainability, but it does not have an informational character at all.

Thirdly, tools were considered under the aspect of being already researched under the term of corporate sustainability. If there were already researches about a tool this was used as a favorable factor in the selection field. A nonobservance of a particular tool in literature, however, did not lead to an exclusion of that particular tool immediately. Nonobservance in literature can happen for two reasons. It can be either an indicator of insignificance and infeasibility in the context of corporate sustainability. In this case, the tool was sorted out. It can mean to another that the tool has not been identified under the term of corporate sustainability because of its universal and innovative possibilities. This is particularly important for Web 2.0 based and other technological tools. These tools were explicitly chosen for further research in the context of corporate sustainability.

Eventually 30 tools were selected for the cataloging process. Table 1 gives a brief overview about the chosen tools. In literature most of the tools are already described with its most important features (see BMU/econsense/CSM 51ff, see Baumgartner 2010, 185ff). For a more detailed description, you can look at the literature mentioned above.

ABC analysis	Balances	Benchmarking	Blog
Budgeting	Capital expenditure budgeting	Checklists	Compass
Cost accounting	Cross impact analysis	Decision support system (DSS)	Dialog instruments
Early detection systems	Efficiency analysis	Employee suggestions	Flow of materials and energy
Further training	Hazard analysis	Key figures	Operational environmental information systems
Product line analysis	Quality management systems (QMS)	Reporting	Scenario analysis
Social networks	Supply chain management (SCM)	Sustainability balanced scorecard (SBSC)	Sustainability management system
Wiki	Workflow management system	Geographic information System (GIS)	

Table 1 – selection of tools for the initial cataloguing process
Restrictive Interest Rate Policy after German Unification
Source: own contribution

3.1 Selection criteria and cataloging method

The criteria used for the cataloging process base upon a developed model. This model specifies respectively operationalizes the abstract economical concept of sustainability for corporate use. According to the St. Gallen Model normative, strategic and operational management were identified as the three scopes of duties for corporations' management. Strategic and operational management were used for further research within the model. Strategic management is a special type of general management. In a corporation, it is quite often settled within a function or institution. The primary objectives are to find out about future potentials of success and to operationalize them to save long-term market operation (see Gminder 2006, 97). Strategic management aims for an increase of effectiveness whereas operational management aims for efficiency (see Bea/Haas 2005, 69).

In case of corporate sustainability, the objectives are more extended. Besides traditional economic aspects, ecological and social aspects are relevant as well. Dyllick et al. introduces the idea of ecological competitive strategies (see Dyllick/Belz/Schneidewind 1997, 75ff) which Gminder et al. enhances to sustainability-oriented strategies (see Gminder et al. 2002, 109ff). Baumgartner uses their theory to derive six specific sustainability strategies for a strategic market positioning (see Baumgartner 2010, 140ff). Those strategies range from a simple focus on sustainability to a total observance of sustainability during the business decision-making process.

An introvert strategy tends to simply follow legal sustainability requirements and rules. A conservative strategy focuses on increasing efficiency and productivity to deal with ecological and social aspects as cost efficient as possible. The primary objective of an extrovert strategy is to avoid reputation losses respectively reputation risks. An extrovert transformative strategy extends that strategy as a development towards sustainable market conditions is targeted. A visionary strategy tries to completely use the potential of differentiation and to increase efficiency and effectiveness to improve both competitive ability and ecological and social effort. The last strategy and most focused on sustainability is a visionary systemic strategy. Sustainability is part of every decision the company makes and is totally committed with the corporations thinking and acting.

Trade-offs and the complexity of the three dimensions, ecology, economy and society call a fallback for the strategies efficiency, consistency, and sufficiency. Efficiency tries to solve problems with efficiency enhancements, consistency with the replacement of materials and sufficiency with relinquishment. Ecological sustainability aims for decreasing environmental harms caused by the use of natural capital within economical processes. An efficiency strategy focuses on resource productivity of natural capital and therefore the ratio between value creation and ecological damage. The more the ratio tends to value creation the better is the degree of eco-efficiency (see Langer 2011, 23). The use of a consistency strategy leads to eco-effectiveness. Products and processes are used for a better regeneration and assimilation of natural capital (see Weissenberger-Eibl 2003, 23). Eco-effectiveness measures how effective minimization of ecological harms takes place. The sufficiency strategy is divided into two parts. Supporters of the one part claim a change of life and business behavior can be accomplished by corporations (see Hart 1997, 75). Supporters of the other part claim only society has the power to change life and business behavior (see. Dyllick/Hockerts 2002, 137). Social sustainability centers for both a gain of intra-company human and social capital and societal social capital (see Arnold/Freimann/Kurz 2001, 52). Sufficiency focuses on human and intra-company capital (see Langer 2011, 25) Human resources are the employees themselves and their expertise. Know-how can be knowledge or motivation and can be extended by trainings, workplace designs, etc... . Social resources represent investments without an immediate economical return as creation of apprenticeships, jobs for disabled people, equality of opportunities, etc... (See Arnold/Freimann/Kurz 2001, 52). Consistency tries to involve stakeholder to increase transparency. Thus, the business strategy is characterized by discourse and stakeholder involvement (see Langer 2011, 26). Efficiency attempts to increase human and social capital at its most efficient way. Socio-efficiency measures social action in rela-

tion to value creation (see Langer 2011, 25). In addition, aspects as equal rights, child labor, security of employment or social mission statement important and hence are assigned to the term socio-effectiveness (see BMU/econsense/CSM 2007, 16).

From the sufficiency´s viewpoint, economical sustainability aims for the preservation of all forms of economical capital (see Gminder et al, 97). Consistency tries to save competitive ability, achievement power and action ability (see Langer 2011, 27). Efficiency attempts to calculate opportunities and risks, to manage scarcities and to get a better ratio of desired and undesired impacts (see BMU/econsense/CSM 2007, 16). It is the classic business objective, increasing the company´s value and increasing the profitability of its goods and services.

According to those dimensions, four challenges companies need to face are derived. The *ecological sustainability challenge* is to decrease the total amount of environmental harms, thus to increase eco-effectiveness. The *social sustainability challenge* on the one hand focuses on decreasing negative social influences and on the other hand, it tries to initiate positive social effects, thus, to increase socio-effectiveness. The *economical challenge* is to manage ecological and social aspects in a cost efficient way. Therefore, its objective is to increase eco and socio-efficiency. Being economically effective is important, in addition; however, this has been discussed and researched in economical literature quite often. Thus, it is not used for further research. The *integration challenge* consists of two components. One component is the approach to instantly fulfill the three former mentioned challenges (efficiency and effectiveness). The other component is the integration of social and ecological aspects into usual business management.

The company´s departments are connected to each other; however, the way of acting to deal with the four challenges differs. Hence, it is useful to know in which department a tool can be used and what its possibilities are to support a departments sustainability objectives. Therefore, the tool´s application area is used as a criterion within the cataloging process. The selected departments are controlling, procurement, marketing, human resource, operations management, accounting and logistics.

According to the three general functions of management, planning, implementation and control (see Stahl/Grigsby 1997, 11); being a planning or control tool is incorporated into the cataloging process. Communication is an important opportunity to appreciate the company´s image. Hence, it was selected as a criterion, too. An inquiry of 150 middle and top managers gives information about the managerial use of tools. The grading ranges from seldom to often and not applicable (see BMU/econsense/CSM 2007, 18).

3.2 Results of the cataloging process

Tools for operational management and therefore for direct acting within the departments are *ABC analysis, reporting, balances, blog, budgeting, DSS, operational environmental information systems, checklists, key figures, capital expenditure budgeting, workflow management system, flow of materials and energy, sustainability management system, product line analysis, QMS, hazard analysis, social networks, SCM, cost accounting, further training, wiki* and *GIS.* The tools left can be used for strategic management. Especially mentionable are tools, which can be used for both, strategic and operational management. These are *blog, balances, operational environmental information systems, DSS, key figures, capital expenditure budgeting, sustainability management system, product line analysis, QMS, hazard analysis, social networks, SCM, wiki* and *GIS.* Most of the tools are indirect technological only *blog, workflow management system, social networks, further trainings, GIS* and *wiki* are direct technological. Methods are *operational environmental information systems, DSS, sustainability management system, SCM, SBSC.* Those are both planning and implementation tools.

The managerial use of all tools is balanced between often and seldom. There is no information about the managerial use of the direct technological tools. Every tool qualifies to support the company dealing with the ecological challenge. The social challenge can be faced with almost every tool, too. *Budgeting, operational environmental information systems, capital expenditure budgeting, compass, flow of materials and*

energy are not suitable to solve social problems. A tool which can be used to increase eco or socio-effectiveness can be helpful to increase efficiency in terms of rationalization respectively cost saving. Apart from *ABC analysis, benchmarking, balances, cross impact analysis, compass, flow of materials and energies, hazard analysis*, the tools can be helpful to deal with the integration challenge.

Generally, all tools can be applied in a more or less weak manner in every strategy. Hence, an assignment to a strategy took place under the term of being particularly useful. An introvert strategy does not have special requirements for sustainable management and thus there are no specific tools to mention. A conservative strategy centers eco-efficient and socio-efficient objectives and processes. *ABC analysis, benchmarking, balances, budgeting, operational environmental information systems, checklists, DSS, efficiency analysis, early detection, key figures, capital expenditure budgeting, compass, workflow management system, flow of materials and energy, QMS, SCM, SBSC, cost accounting, employee suggestions, further training* and *wiki* focus on an increase of efficiency and therefore are particularly qualified to be used within this strategy. Those instruments are also qualified to be used for eco and socio-effectiveness and can be assigned to a visionary strategy, too. A positive image and an avoidance of reputation risks are the main objectives of an extrovert strategy. Communication tools are particularly useful to transport a positive image. These are *reporting, blog, dialog instruments, social networks* and *wiki*. Especially the *tools product line analysis, hazard analysis* and *scenario analysis* can help to prevent from reputation risks.

Within the controlling department, tools for measurement and correction of performance issues are needed. Almost every tool can serve these issues. *Blog, capital expenditure budgeting, compass* and *employee suggestions* are an exception. Within the procure department tools are needed which support purchasing decisions. *ABC analysis, balances, budgeting, operational environmental information systems, checklist, DSS, efficiency analysis, key figures, sustainability management system, product line analysis, QMS, SCM, SBSC, wiki* and *workflow management system* can be helpful.

Every tool but *ABC analysis, cross impact analysis, capital expenditure budgeting, compass, flow of materials and energies, product line analysis, hazard analysis, scenario analysis, cost accounting* and *workflow management system* can support the marketing department to find out what customers desire and how to meet their needs. *Reporting, budgeting, operational environmental information systems, checklist, DSS, dialog instruments, key figures, sustainability management systems, QMS, social networks, SBSC, further training* and *wiki* are suitable to deal with human resource issues. Every tool but *reporting, blog, cross impact analysis, early detection systems* and *social networks* can support operations management in analyzing and managing organizational processes.

Many tools can support the accounting department. A few exceptions are *ABC analysis, blog, cross impact analysis, dialog instruments, early detection systems, social networks, scenario analysis, employee suggestions,* and *workflow management system*. Suitable tools to manage the flow of goods and therefore to support logistics are *ABC analysis, operational environmental information system, checklists, DSS, efficiency analysis, key figures, sustainability management systems, QMS, SCM, SBSC, employee suggestions, further training, wiki* and *workflow management system.*

3.2 More detailed research of a web 2.0 tool

Web 2.0 tools have not been researched within the context of sustainability quite often. Therefore, a more detailed research is done in the following. Due to the length of this paper, a *social Network* is described along some criterions of the mentioned catalog only. According to Boyd/Ellison social network sites are "web-based services that allow individuals to (1) construct a public or semi-public profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system" (Boyd/Ellison 2007). There are two types of social networks, intra company social networks and external social networks. Intra company social networks serve as central databases of company based employee information. Employees can be con-

nected to telephone numbers, email addresses or instant messaging. Furthermore, they get the possibility to set up a profile (see Back/Gronau/Tochtermann 2009, 73f). External social networks supplement traditional communication channels. Information, which was prepared for traditional publication, is additionally published on social networks (see Schindler/Liller 2011, 69). Social networks do not focus on simple illustration of information because they also can act as a dialog instrument to get in touch with external stakeholders.

Ecological challenge: The main objective to face the ecological challenge is to extend usual communication channels to reveal the company´s environmental related processes. This can motivate the company to optimize future processes and to decrease the total amount of environmental harms and therefore to increase eco-efficiency. Environmental topics can be discussed stakeholders to determine upcoming trends. Those impressions can be considered for decision-making processes.

Social challenge: Employees use intra company social networks to get in touch with each other and to find out about other employee´s skills. In this manner, search costs for building up a common context are minimized. Moreover, communication between each other works more flexibly and more efficiently (see Back/Gronau/Tochtermann 2009, 70). This leads to a better working atmosphere which can result in increased employee motivation and hence in an increase of socio-efficiency. There are two ways for external social networks to face the social challenge. One way is to extend usual communication channels to save the license to operate by disclosing social commitment. Stakeholder concerns can be integrated into future decisions. The other way aims for a gain of human resources. Surveys show that skilled labor below 35 years often gets an idea of a company by internet (see Pleil 2010, 45). Thus, communication and presentation functions of social networks need to be used at its best to make a company as attractive as possible for potential applicants. The human resource department itself can look for potential applicants at job specialized social networks.

Economical challenge: The Company profits from a better work atmosphere and an optimization of processes because employee contact with each other highly increases (see Back/Gronau/Tochtermann 2009, 70). Efficient knowledge networks and a better return on investment in human capital (see Back/Gronau/Tochtermann 2009, 70) decrease cost of information search and development of solutions. This leads to a better socio and eco-efficiency. Furthermore, economic success can be explained to the stakeholders due to ecological and social commitment.

Integration challenge: External social networks are not specified for only one topic. Issues from all three dimensions can be pointed out. This supports the content integration. The instrumental integration aims for adjustment with usual communication channels to achieve the best effect. The integration challenge for internal social networks is the integration into identity management and existing human resource systems (see Back/Gronau/Tochtermann 2009, 75).

Strategy: The increased contact of employees with each other leads to optimized processes and a more efficient functioning. Thus, it can be assigned to a conservative strategy. Besides efficiency, it can increase effectiveness, too. Hence, it can be assigned to a visionary strategy, as well. However, the main function is communication and it is specifically useful to present the company´s image. Therefore, it can finally be assigned to an extrovert strategy.

4. Conclusions and future work

From the authors' viewpoint, in order to reach for a sustainable development inside of an enterprise, several steps have to be taken into account. Beside a general environmental or sustainable oriented policy on strategic level, the selection of critical and useful it-based methods for the support of sustainable development on strategically level is a core criterion. In order to support the usage of a modular toolbox, that will be a holistic oriented, input-, output- and process information integrating approach aiming for a sustainable development instead of only reacting on ecologic related legal compliance or economic optimiza-

tion. Beside the analysis of needed generic functional support as a precondition, structured and ordered catalogs of usable functions can support a company, especially small and medium sized enterprises, with an overview of the needed complexity for environmental and sustainable related corporate information systems, like environmental management information systems or sustainable reporting systems.

The current catalog can be only seen as a starting point, allowing with the given selection criteria and cataloging method to extend with further methods and functions. As some, obvious functions have been omitted intentional, a next step would be the investigation on semantically and interconnection connection points between the analyzed and cataloged items. For the activity flow of a company trying to establish an internal sustainable development, some functionality has to be transported directly into a basic toolbox system for information management. The basic modules for such an information system will contain functionality for the areas of (simple) sustainability reporting, an integrated decision support system, a visual analysis component, functionality of a geographical information visualization, single-sign-on functionality, data integration layers and a set of interfaces for integration and extracting information from and to the toolbox out of other enterprise information systems. As the use of such an modular toolbox system can be included to the existing enterprise information system landscape, over the mentioned interfaces or further bridging and integration techniques, all the available information on the used strategically functions and methods could be used in a single system, which is capable of creating and reporting an overall sustainability benchmark for each using company.

The catalog of structured it-based methods for the support of sustainable planning and governance in enterprises can be used further on, to compare the actual condition with the targeted condition, by the amount of fulfillment in each of the defined goals of the used methods. By the fulfillment rate the usage of each function can be adjusted to a more effective and accurate output. If the used methods are available from a structured catalog, other methods like a multi-criteria decision analysis can be applied on the usage, allowing not only a simple pool of functions, methods and approaches to use, but also a ranked and verified system of possible solutions.

Such a structured catalog could be an important part in the assessment process of the key-values for a corporate environmental strategy. Combined with a high grade of flexibility, which allows each company to adapt and develop their single specialized catalogs with consideration to the individual experiences, the usage of different methods should be evaluated in periodical cycles, re-indexing and structuring the catalog as well as from technical as content perspective. A theoretical forecast could be the usage of the structured methods as part of included instruments in given environmental policy audit systems like EMAS or ISO14000.

Bibliography

Arnold, W.; Freimann, J.; Kurz, R. (2001): Grundlagen und Bausteine einer Sustainable Balanced Scorecard (SBS). Werkstattreihe Betriebliche Umweltpolitik. Band 17. Kassel

Baumgartner, R. J.; (2010): Nachhaltigkeitsorientierte Unternehmensführung. Modell, Strategien und Managementinstrumente. München

Back, A; Gronau, K.; Tochtermann, K. (2009): Web 2.0 in der Unternehmenspraxis. Grundlagen, Fallstudien und Trends zum Einsatz von Social Software. Oldenbourg

Bea, F.X.; Hass, J. (2005): Strategisches Management. 4. Auflage. Stuttgart

Boyd, D.M; Ellison, N.B. (2007): Social network sites: Definition, history, and scholarship, in: Journal of Computer-Mediated Communication, 13(1), article 11

Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit (BMU); econsense; Centre for Sustainability Management (CSM) (Hrsg.) (2007): Nachhaltigkeitsmanagement im Unternehmen. Von der Idee zur Praxis: Managementansätze zur Umsetzung von Corporate Social Responsibility

and Corporate Sustainability. Berlin, Lüneburg
Dyllick, T.; Belz, F.; Schneidewind, U. (1997): Ökologie und Wettbewerbsfähigkeit.. München, Zürich
Dyllick, T.; Hockerts, K. (2002): Beyond the business case for corporate sustainability, in. Business Strategy and the Environment, Vol. 11, No. 4
Ebersbach, A.; Glaser, M.; Heigl, R.; Warta, A. (2008): Wiki. Kooperation im Web. 2. Auflage. Berlin, Heidelberg
Frost, G., Jones, S., Loftus, J. and Van Der Laan, S. (2005), A Survey of Sustainability Reporting Practices of Australian Reporting Entities. Australian Accounting Review, Vol. 15
Giesen, N.; Chen, L.; Dahlem, N. et al. (2006): "Ein Informationssystem zur Bewertung regionaler Projekte unter Berücksichtigung nachhaltiger Entwicklung". In: Wittmann, J., Müller, M. (Hrsg.): Simulation in Umwelt- und Geowissenschaften / Workshop Leipzig, Shaker Verlag
Giesen N. and Marx Gómez J. (2009): A web-based information system rating regonal projects by considering sustainable development. In: Marx Gómez, J.; Rizzoli, A.E.; Mitkas, P.A.; Athanasiadis, I.N. (Hrsg.): Information Technologies in Environmental Engineering (ITEE 2009) - Proceedings of the 4th International ICSC Symposium Thessaloniki, Greece; Springer, Berlin
Giesen, N; Hashemi Farzad, T.; Marx Gómez J. (2009): A component based approach for overall Environmental Management Information Systems (EMIS) integration and implementation. In: Wohlgemuth, V.; Page, B.; Voigt, K. (Hrsg.): EnviroInfo 2009 - Environmental Informatics and Industrial Environmental Protection: Concepts, Methods and Tools; Shaker, Aachen. Volume 2
Gminder, C.U. (2006): Nachhaltigkeitsstrategien systemisch umsetzen. Exploration der Organisationsaufstellung als Managementmethode. Wiesbaden
Gminder, C.U.; Bieker, T.; Dyllick, T.; Hockerts, K.; (2002): Nachhaltigkeitsstrategien umsetzen mit einer Sustainability Balanced Scorecard, in. Schaltegger, S.; Dyllick, T. (Hrsg.) Nachhaltig managen mit der Balanced Scorecard. Wiesbaden
Langer, G. (2011): Unternehmen und Nachhaltigkeit. Analyse und Weiterentwicklung aus der Perspektive der wissensbasierten Theorie der Unternehmung. Wiesbaden
Pleil, T. Studentisches Team (2010): Mehr Wert schaffen. Social Media in der B2B-Kommunikation, in: Institut für Kommunikation der Hochschule Darmstadt, Profilwerkstatt. Darmstadt
Schindler, M.-C.; Liller, T. (2011): PR im Social Web. Das Handbuch für Kommunikationsprofis. Köln
Stahl, M.J.; Grigsby, D.W. (1997): Strategic Management. Total Quality & Global Competition
Weissenberg-Eibl, M.A. (2003): Unternehmensentwicklung und Nachhaltigkeit. Rosenheim