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A TRIPLE BOTTOM LINE INNOVATION AUDIT TOOL FOR
ICT PRODUCT-SERVICE MIX APPLICATIONS

Michael Kuhndt, Senior Consultant, Sustainable Production and Consumption Department, Wuppertal Institute for Climate, Environment and Energy; Director, Triple Innova, E-Mail: mkuhndt@cityweb.de

Burcu Tunçer, Consultant, Sustainable Production and Consumption Department, Wuppertal Institute for Climate, Environment and Energy, E-Mail: burcu.tuncer@wupperinst.org

Dr. Christa Liedtke, Head of Department, Sustainable Production and Consumption Department, Wuppertal Institute for Climate, Environment and Energy, E-Mail: christa.liedtke@wupperinst.org

Background
A wide range of actors from intergovernmental organisations such as UNEP, UN DESA, UNDP, UNIDO and OECD to NGOs, industry and governments have been working on the issue of sustainable production and consumption in the last decade. In the Johannesburg Plan of Implementation adopted in the World Summit for Sustainable Development in August 2002, §14 of Chapter III refers to the “encouragement and promotion of the development of a 10-year framework of programmes in support of regional and national initiatives to accelerate the shift towards sustainable consumption and production (SCP) to promote social and economic development” (WSSD, 2002). As a follow-up of the Johannesburg, the European Institutions and the European Commission, in particular, has determined development of 10-year framework of programmes on sustainable consumption and production as a key area of action.

Many authorities have reflected on the fact that eco-efficiency improvements are overrun by the limits to efficiency gains and overconsumption (overuse) of environmental resources is happening. For example, the review of the European Union’s 5th Environmental Action Plan concludes that growth in environmentally damaging sectors simply outweighs the improvements attained by better technology and stricter environmental controls (EC, 2000). According to the comprehensive study by the World Resources Institute of five advanced economies (the US, Germany, Japan, Austria and the Netherlands) conducted in cooperation with the Wuppertal Institute, the pollution and waste have continued to rise exponentially, despite the much-vaunted shift towards knowledge-based economies (WRI, 2000). Materials intensity as traditionally measured (based on direct material inputs or DMI to GDP ratio) has levelled off over the past decade (Adriaanse, et. al., 1997, p.2). This surely implies that use of natural resource commodities may now be growing in parallel with economic growth1 and “eco-innovations” (Beard and Hartmann, 1999; Rennings 2000) are required in order to create a decoupling effect.

On the other hand, increasing levels of absolute resource consumption is combined with an extreme inequality of resource consumption. The evidence for the “distorted geography of consumption” indicates that the overall consumption of the richest fifth of the world’s

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1 In emerging economies, which have more rapid growth trends, it is most likely that the picture would get even worse.
population is 16 times that of the poorest fifth (OECD 2002, p.12). Consumption disparities launches the question whether equality means for the third world “catching up with the first world”.

Finding a way to resolve consumption disparities would probably link to the social pillar of SCP. On the social side, reflection more on regional differences such as cultural needs and addressal of local quality-of-life priorities gain importance. Most of the world is disconnected from the most basic services and products. For example, UNDP Human Development Reports delivering a wide range of indicators covering issues as health, education, acces to resources for a decent standard of living, personal security, equality for women and mean and human and labour rights point at significant differences in macro level societal priorities between the first and third world. (UNDP, 1998) Hence, reach out of the services as well to the poor beyond the rich world is a major SCP aspect2.

Besides the problem of addressing local issues, considerable attention is drawn at social implications of the act of consumption3. Researchers state that as product chains get more global and complex (Moltke and Kuik, 1998; Kuhndt, et al., 2003b) satisfaction of needs get more material intensive, unquestioned and often homogenized departing from „humane consumption“ (Ger, 1997).

Hence, in today’s markets, initially understanding all pillars of SCP problems and afterwards addressing them calls for radical innovations4, which would mark a continuous break with past practices and experience. Radical innovations shall entail radical improvements on all pillars of sustainability meaning that we shall strive to attain eco-innovations, economic innovations and social innovations simultaneously.

A source of radical innovations on all pillars can be the function-based approach, which aims at considering the entire consumption and production system as a whole. Proposed as well by UNEP (UNEP, 2003, p. 7), “Functional-based Approach” aims at tracking consumption patterns in each need area such as mobility, food, energy, housing, clothing, leisure, etc.

However, realization of radical thinking in corporations is a highly complex process and requires involvement of many actors (Mol and Sonnenfeld, 2000). As in the case of product-service system (PSS) developments, corporations would be in need of novel mechanisms to raise awareness, to develop dynamic skills for creativity and would require an innovative institutional framework with incentives. As Green et al. (, 2001, p. 7) mentions innovative pathways towards sustainability require drastic changes in corporate visions, in addition to all sorts of internal organisational and managerial changes.

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2 This aspect is mentioned as „social effectiveness“ by Dyllick and Hockerts (2002).
3 This issue is often referred in the scope of „sufficiency” debate (Schumacher, 1974; Sachs, 1993). For corporations, it would mean rather than fuelling the demand for more unsustainable products, they might try to channel demand towards less problematic areas.
4 It is believed that incremental innovations can bring only short-term solutions for sustainability and radical innovations are demanded for absolute societal and environmental gains. Radical innovations, by definition, would require new skills and novel management of the organisations (Freeman, 1991, p. 307, in: Orozco, 2002).
all, management of SCP problems require a focus on the dynamic issues affecting business processes and a better understanding of creative processes, which can lead to performance improvements at the resource use or the impact side or Triple Bottom Line (TBL) improvements. As seen in Figure 1, how the dynamic characteristics of the system of innovation affects the resource use and impact side still stays as a „Black Box“ to the sustainability research. We believe that a thorough study of this black box is required. Only after than, the relevant organisational factors and processes can be addressed by the policy makers or managed by business in order to achieve radical improvements for SCP.

**Aim of the paper**

In this paper, we strive to introduce an initial framework for a tool, which can allow corporations to recognize areas of opportunity for radical innovations both at the management level and at the resource use and/or triple bottom line impact level. It is proposed that they can further work on these factors in a stakeholder process and be able to develop product-service mixes, which would ultimately lead to macro level performance improvements for SCP.

Our core aim is to introduce a part of the study carried out in the scope of the overall project, entitled “Life Cycle Approaches to Sustainable Consumption”, which was commissioned by the National Institute for Advanced Industrial Science and Technology in Japan (AIST). The goal of this study was to develop a Triple Bottom Line Innovation Audit Tool for Information and Communication Technology (ICT) product-service mix applications. The agenda of sustainable development for business emphasizes the importance of addressing all three pillars of sustainable development i.e. economic justice, environmental quality and social justice (Elkington, 1997). Being considered as any other activity of business, the system of innovation shall also have positive implications on all three pillars of sustainability.

The system of innovation consists of the corporation and its network (i.e. supply chain and other relevant stakeholders). In literature, different types of innovations such as product innovations, organisational innovation or technological innovations are mentioned. However, the difficulty of making a distinction between these types is also indicated, as happening of one leads to another. They are certainly not mutually exclusive. Hence, this paper concentrates on systems of innovations having the objective of achieving triple bottom line improvements.

This study intends to investigate new ways of reducing CO₂ emissions from the viewpoint of the consumer.

ICT sector is selected as the focus, since it is a fast developing sector and it is assumed to be intrinsically innovative.

Along the project, the terminology of “triple bottom line innovations” or “product-service mix applications” instead of the term “Product Service System” was utilized, since this expression is not established in the ICT sector. Furthermore, there is no sufficient implication that this concept will
As stated above in our proposition, the “Innovation Audit Tool” can allow companies to determine their internal strengths and weaknesses and external opportunities and threats in developing sustainable product-service applications. In this respect, the following research questions are found to be significant:

- Which internal factors are relevant for ICT companies in developing product-service mix applications with superior environmental, social and economic performance? What are the external demands on the ICT companies in that respect?
- How can ICT companies assess (measure) their strengths and weaknesses or level of knowledge and skills in developing sustainable product-service mix applications?

What are major corporate factors for TBL Innovations? : Implications from the theory

An initial list of categories affecting innovation processes, which constitute the basis of the “Innovation Audit Tool”, is collected from the innovation management literature, evolutionary economics and institutional economics, to which researchers often refer in order to explain innovation processes.

Prior to the construction of the tool, we have realized the significance of adapting a formal definition of TBL innovations, which is provided in the following Box. The referred study elaborates further on the significance of each bottom line in relation to SCP.

“Triple bottom line innovations are novel improvements developed within a network of institutions aiming at preservation of absolute amount of natural resources and enhancement of social and economic capital”.

It is found useful to have two different levels of factors i.e. micro and meso to start developing an understanding of the dynamics of the process of innovation (See Figure 2). At the micro level, the focus is on the corporation. We try to find the important categories that shall exist in the corporation for it to devise innovations with TBL significance.

The micro level factors are based on evolutionary economics (Nelson, 1982), where “static capabilities” and “dynamic capabilities” are suggested for the attainment of an innovative organisation. Routines of an organisation are central elements in determining its static capabilities. Major function of routines is often understood as the co-ordination of the skills of an organisation (Dosi, 2000 p. 5). Routines in corporations would also refer to daily business operations. Thus, how an organisation makes use of its financial, social and natural capital in its day-to-day business is relevant for an understanding of its static capabilities. On the other hand, “communication channels, information filters and problem-solving strategies that develop between groups within an organisation and between organisations” (Henderson and Cockburn, 2000) are relevant for dynamic capabilities. Hence, collaborations through horizontal and vertical networks within the organisation and co-operation with other organisations are crucial for successful innovation activities.

On the other hand, the meso level, we focus on the interactions between societal actors, which affect the working conditions of business. The conditions of the institutional set-up would also influence the orientation of micro level capabilities. Institutional economics, which is oriented towards the set of factors that mould and define humane interactions, specifically within organisations and between them, has been the focus for deriving meso level factors.

become widely adopted (Charter and Clark, 2003, p. 7-16). However, product-service mix applications in the Information and Communications Technology (ICT) Sector are commonplace in businesses aiming at provision of outsourcing services.
According to North (1990), institutions consist of both “informal constraints” and “formal constraints”. He explains them along a continuum from customs and traditions at one end to written regulations at the other (North, 1990, p.46). Formal constraints imposed by the stakeholders on the corporation, which may include all political and judicial rules, economic rules and contracts, can directly affect the micro capacity development. On the other hand, informal constraints such as codes of conduct, norms of behaviour, creation of trust, shared visions and informal agreements affect the implementation routes or outcomes of the formal institutions.

![Figure 2: The framework of factors important in the initiation of TBL innovations and assessment of significance of triple bottom line innovation.](image)

As illustrated in Figure 2, the performance in terms of the micro and meso level factors can directly affect the level of enhancement of social and economic capital and to which extent, absolute amount of natural resources is preserved; hence, TBL innovation significance. Further on, this deduction will affect the magnitude of the TBL innovation ranging from incremental to radical innovations. Once again, we believe that an ultimate discussion on the magnitude of TBL innovations is relevant for businesses if they would like to have a meaningful contribution to sustainability.

**An Overview of the “TBL Innovation Audit Tool”**

According to innovation management theory, as stated by Rogers (2003, p. 420), innovation process in an organisation occurs in a sequence of five stages (See Figure 3). The “TBL Innovation Audit Tool” at first concentrates on the initiation part of the innovation process, namely on the “agenda setting” and “matching” processes. In addition to the classical innovation management understanding, triple bottom line innovation requires the involvement of stakeholders at each stage.

Agenda setting would occur when an organizational problem is identified that creates a perceived need for an innovation. The agenda-setting stage of in the innovation process in an organisation consists of (1) identifying and prioritising needs and problems and (2) searching the organisation’s environment to locate innovations of potential usefulness to meet these organisational problems. At the matching stage, the organization’s members in interaction with stakeholders attempt to determine the feasibility of the innovation in solving the organisation’s problem. Such planning includes anticipating the benefits and the
problems that the innovation would encounter when it is implemented. (Based on Roger, 2003, p. 422,423)

Figure 3: An overview of the initial version of the “TBL Innovation Audit Tool”.

A detailed flow of the TBL innovation process is shown in Figure 3. Here, the innovation process will initiate with the identification of a need for TBL improvements. A strategic assessment of the market opportunities existing in terms of functional sales can lead to initiation of this process. This is observed as the mainstream case in many companies adapting functional thinking.10

Following, a list of ICT product-service mix concept ideas in a functional need area can be generated at different levels of the organization. Then on, “TBL Significant Scanning Tool” would enable the corporation to compare different concepts and assess their contribution to the TBL. This stage is also in line with the “significance assessment” pillar of the framework introduced earlier (see Figure 2).

10 For example, in the area of Commercial Cleaning Equipment, Electrolux euroclean in Sweden has a product-service line shifting from supplying products to providing function. The ownership of the product is retained by the company and the conventional sales strategy has been replaced by leasing and service contracts (Agri et al, 1999).
TBL Significance Scanning Tool

This tool is based on the specific concerns on the ICT sector developments and sustainability requirements for design. While stakeholder demands and concerns can change drastically from one sector to another, these issues might correspond to resource use or TBL impacts created at various life-cycle phases and macro level implications. We have based our list of assessment on the state-of-art literature (GRI, 2002; Kuhndt, et al., 2003; Charter and Clarke, 2003; Fichter, 2003; GRI, 2003) discussing the environmental, social and economic implications of ICT products and services. The common methodology used in the literature is adapted; so that the tool provides an assessment of TBL impacts\(^{11}\) in terms of first order, second order and third order effects\(^{12}\). The tool asks questions on the possible change in the impact level regarding the issues raised in the state-of-art literature. These impact headings are listed in Table 1. Going through a questionnaire based on these impact headings, the corporation can attain a specific score for the impact level improvement of each product-service concept idea, then compare different ideas and decide to choose one with a higher total score.

\(^{11}\) Here, a “cause and effect” relationship is foreseen. Even though, the empirical relationships between the resulting effect, or potential effect, on the TBL are “impacts” and cause of the effect or “aspects” i.e. the company’s activities, products and processes are unknown; there has been research conducted on the potential impacts of ICT at three different pillars. Here, we concentrate on the potential impacts on the environment, society and the economy.

\(^{12}\) The literature diversifies in terms of the definition of first order, second order and third order impacts. Here, we adopt the definition of EITO (2002). First order sustainability implications depend on the physical existence of ICT and the process involved. Each life-cycle phase of the product-service mix is covered at this pillar. Second order effects stem from the ongoing use and application of ICT, while the third order effects form the aggregated results of large numbers of people using ICT over the medium to long term (EITO, 2002, p. 253).

Table 1: Major criteria listed in the “TBL Significance Scanning Tool” (Adapted from GRI, 2002; Kuhndt, et al., 2003; Charter and Clarke, 2003; Fichter, 2003; GRI, 2003).

<table>
<thead>
<tr>
<th>Significance Level</th>
<th>First Order Level</th>
<th>Second Order Level</th>
<th>Third Order Level</th>
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<tbody>
<tr>
<td></td>
<td>Environmental Impacts</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>- Impacts from energy use such as GHG emissions and land use</td>
<td>- Environmental impacts of increased or decreased transport</td>
<td>- Energy use impacts such as carbon emissions stemming from aggregated ICT use at the macro economic level</td>
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<tr>
<td></td>
<td>- Other resource use impacts such as water consumption, wastewater discharge, air emissions, solid waste discharge</td>
<td>- Environmental impacts from increased product life-times</td>
<td>- Possible Environmental impacts on regions due to changing settlement patterns</td>
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<tr>
<td></td>
<td>- Biodiversity impacts</td>
<td>- Impacts from use of ICT in other business systems</td>
<td>- Land-use impacts from aggregated ICT use at the macro economic level</td>
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<tr>
<td></td>
<td>- Toxic release impacts (with respect to the aspect of design utilizing toxic components)</td>
<td>- Environmental impacts of the rebound effects created by a change in consumer behaviour</td>
<td></td>
</tr>
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<td></td>
<td>(All impacts applies to manufacturing, operation, disposal and phases)</td>
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A Triple Bottom Line Innovation Audit Tool for ICT Product-Service Mix Applications

<table>
<thead>
<tr>
<th></th>
<th>First Order Level</th>
<th>Second Order Level</th>
<th>Third Order Level</th>
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</thead>
<tbody>
<tr>
<td>Social Impacts</td>
<td>- Increase in employment</td>
<td>- Social impacts from access to better services / Digital Divide (such as access to health services, E-learning, government services, E-commerce, government information and telework)</td>
<td>- Cultural homogeneity</td>
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<tr>
<td></td>
<td>- Occupational and Customer Health and Safety Impacts</td>
<td>- Social impacts from addressing barriers of access</td>
<td>- Cultural biodiversity</td>
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<td></td>
<td>- Intellectual property rights impacts</td>
<td>- Social impacts from enhancement of democratic participation (e.g. increased voting, freedom of expression)</td>
<td>- Enforcement of local communities</td>
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<td></td>
<td>- Customer privacy impacts (can be also second order effect)</td>
<td>- Availability in emergency situations and disaster relief</td>
<td>- Enhancement of civic culture</td>
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<td></td>
<td></td>
<td>- Social impacts from security challenges</td>
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<td></td>
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<td>- Social impacts from addressing barriers of access</td>
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<td>- Social impacts from enhancement of democratic participation (e.g. increased voting, freedom of expression)</td>
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<tr>
<td></td>
<td></td>
<td>- Availability in emergency situations and disaster relief</td>
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<tr>
<td>Economic Impacts</td>
<td>- Net Sales</td>
<td>- Economic impacts from application of ICT within other businesses</td>
<td>- Economic impacts from long-term and fundamental changes to the global economy</td>
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<td></td>
<td>- Payroll and personnel benefits</td>
<td>- Enhancement on innovation and competitiveness</td>
<td>- Economic impact on patterns of wealth</td>
</tr>
<tr>
<td></td>
<td>- Liquidity impacts (such as debt, borrowings, dividends position)</td>
<td>- Establishment of new financial markets enabling growth and wider participation</td>
<td>- Better share of economic wealth</td>
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<td></td>
<td>- Subsidies received</td>
<td>- Increase in empowerment of consumers</td>
<td></td>
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<tr>
<td></td>
<td>- Tax exemptions or decrease in tax</td>
<td>- Encouragement of ethical corporate behaviour</td>
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<tr>
<td></td>
<td>- Impacts on community, civil society and other groups in terms of donations</td>
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<tr>
<td></td>
<td>- Impacts on other geographic locations and low-income groups</td>
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The process can be more effective; if a team of employees from different departments and a group of external actors are involved with the concept development and make collaborative decisions about each criterion. This is due to the fact that product-service mix would possibly use the resources of a network of organisations as a new business model (i.e. system innovation). Additionally, regardless the order of the effect of assessment, judgement by a single actor is extremely difficult due to weak empirical evidences on the cause and effect relationships. Level of uncertainty possibly will increase, as the order of the effect increases.

**TBL Innovation Capability Scanning Tool**

As stated earlier and given in the framework (see Figure 2), management of TBL improvements requires a better understanding of creative processes, which can lead to performance improvements at the resource use or the impact side or Triple Bottom Line (TBL) improvements. Hence, as a parallel step to utilizing the first tool, the capabilities and incentives in the surrounding environment, in which the organisation functions, shall be assessed. (See Table 2)
The major aim of the “TBL Innovation Capability Scanning Tool” is to develop an understanding in the areas of opportunity upon, which the organisation can work with the objective of becoming an innovator. This tool can also be perceived as an awareness-raising audit for the corporation, which can be completed with the stakeholders, indicating that without existence of particular routines, corporate culture, stakeholder involvement capabilities and supporting institutions, TBL innovations cannot be achieved.

The major list of categories in this tool is based on factors collected in a previous study by Kuhndt et al. (2003). This study has already aimed at deduction of important factors required for functional thinking from a generic literature search and from the learnings of best-case examples. It has been found that “corporate culture” comprising of values and norms as a major factor affecting the direction of action in a corporation (Lake and Mohanty, 1994; Klein et al., 1995; Irani et al., 2003), „organisational learning“ as developments in the knowledge basis and improvement of problem solving competencies in an organisation (Campbell and McGrath, 1997; Probst and Büchel, 1998) and „utilisation of resources for networking“ such as building strategic alliances and partnerships (Gray, 1998) are crucial to consider for an organisation aiming at a direction for functional thinking. With this new phase of the study, we have built upon this previous experience and extended it by adding learnings from the TBL innovation framework (see Figure 2) and innovation management literature focusing on the organisational aspects and determinants of eco-innovations (such as Tuerpitz, K., 2003; Beard and Hartmann, 1999; Rennings 2000) and social innovations (such as Arentsen, 2002) are scanned. Since we believe that TBL innovations shall have significance on all bottom lines, the findings are merged in one list of major categories (See Table 2).

On the other hand, the subcategories are built upon the scanning criteria collected from five major socially responsible investment (SRI) analysis organisations13 (FTSE4Good Index Series Criteria, Dow Jones Sustainability Indexes-SAM Questionnaire, Ethibel Sustainability Index, Ethical Screening Criteria, DOMINI400), two benchmarking / reporting indices (Business in the Community, GRI Telecom Sector Supplement, SA8000) and three methods developed by research organisations working on innovation management (Social and Environment Risk Management Model, Erasmus Research Institute of Management Report, SIID-Phase 2 by Utrech University). Even though a wide range of the SRI analysis organisations exists14, access to the criteria and availability in English language15 was detected as a problem in the study. However, these sources often relating to the major categories identified as described above have been valuable sources in terms in terms of providing concerns / criteria for the management of innovations in the organisations. The whole list of concerns / criteria is then grouped into subcategories as given in Table 2.

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13 In this study we focused on the SRI screening, which includes an evaluation of how well companies manage to integrate corporate social responsibility issues (sustainability based on TBL concept) into their strategic business development process.

14 For example see www.sustainable-investment.org. According to a recent survey, around the world there are at least 142 SRI products from 77 fund managers and a total of 24 analysis/screening organisations (MISTRA, 2001)

15 For example, the top Japanese SRI indices i.e. Nikko Eco-fund and Morningstar SRI index were not available in English.
Table 2: Categories and sub-categories listed in the “TBL Innovation Capability Scanning Tool”.

<table>
<thead>
<tr>
<th>Level</th>
<th>Sections</th>
<th>Categories</th>
<th>Sub-categories derived from Financial Indices and Benchmarking Indices</th>
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| Micro level (Corporation and its relation to its stakeholders) | Static Capabilities    | Vision, policy and strategy          | - Existence of formal policy on social, economic and environmental aspects of business  
- Commitments to international TBL codes of conduct or initiatives  
- Communication of the TBL policy  
- Review of the TBL policy  
- Degree of involvement in controversial sectors |
|                            | Corporate Governance   |                                      | - Distribution of TBL responsibilities at the board level  
- Distribution of TBL responsibilities among operational companies and departments  
- Composition and organisation of the board of directors  
- Corporate Governance policy  
- Corruption Control measures  
- Corporate structure  
- Flexible organisational structure |
|                            | Internal Management Systems |                                      | - Capability to identify significant TBL impacts  
- TBL resource use/impact management and measurement systems  
- Quality control systems  
- Internal reporting and auditing systems  
- Risk management systems  
- Management systems for equal opportunities  
- Health and safety systems  
- Management systems for human rights (including the supply chain)  
- Conflict management  
- Product design focused on TBL improvements  
- Research and Development on TBL improvements  
- ICT Sector specific management practices |
|                            | Top Management Leadership |                                      | - Strategic moves towards sustainability |
|                            | Corporate Culture      |                                      | - Company openness and dynamism  
- Belief in collective decision-making and action |
|                            | (Knowledge Management and) Organizational Learning |                                      | - Employee involvement  
- Employee training  
- Teamwork and autonomy  
- Human resources strategies to build in TBL innovation skills |
|                            | Internal Stakeholder Involvement |                                      | - Formal/Informal communications with the internal stakeholders  
- Job creation  
- Employee support and satisfaction for better (TBL) performance  
- Remuneration policy |
The capacity of the organisation for having appropriate TBL management systems is also significant. For example, without the tools for social innovation or eco-innovation, designers would continue with business as usual practices. A dynamic understanding supporting the management practices shall also be in place for TBL creativity. Without a corporate culture stimulating openness or continuous learning, attainment of new knowledge and integration of it to the daily business routines will happen. One cannot expect innovation from an organisation where questioning of the societal or environmental impacts does not take place. It is mentioned both in eco-innovation literature (such as Gray, 1989; Clarke and Roome, 1995; Hartman et al., 2002) and social innovation literature (Kuhnert and Tuncer, n.d.) that internal and external stakeholder involvement is required.

It is not sufficient for a corporation to be ready on its own for innovation, it shall further be able to affect the factors defining the working conditions surrounding the business. Visionary corporations take active part in shaping the sustainability discussions at the sector, national or global level and support innovation inducing regulation. In this regard, they would be able to eliminate the institutional barriers or slow-down for TBL innovations and commit themselves for continuous improvement.

As a result of running through these two tools, organisations can either decide it needs to build further on its capabilities and work on strengthening institutions or decide that the selected concept can be applied, since the organisational capabilities and institutional potential to support innovations are in place. A decision on the later would bring the corporation to the next stage, namely feasibility evaluation to pass the winning concept idea into reality. Using a feasibility check, the corporation can decide which capabilities and institutions need to be improved to realize the selected concept. The feasibility check shall be much more detailed than the “capability scanning tool”, assessing the market value creation,
stakeholder value creation, level of consumer acceptance and the organisational capabilities to be developed specifically linked to this concept. Currently, the content of this tool is not available, but in the process of development.

Final reflections and Initial Learnings
The major learnings from the study have been as follows:

The demand on corporations to achieve triple bottom line innovations aiming at achievement of simultaneous eco-innovations and social innovations with economic significance is escalating more than ever. While staying economically competitive, business have to holistically address the challenge of material flows still not decoupling from growth and increasing social disparities. At the environmental level, corporations shall strive decreasing their absolute resource consumption i.e. not only internal or first order operations or not only that of a single product chain, but that of all services provided to the society. On the social side, corporations have to reflect more on local quality-of-life priorities, regional differences such as equity of access to basic needs, cultural distinctions, when they are developing new product-service ideas / concepts. All in all, reinforcement of addressing TBL aspects of business is urgently needed.

Another reflection is that the link between two different tools that we have developed still stays weak. Since it is extremely difficult to find the mirror reflection of management practices to achieve a particular first order, second or third order TBL improvements via a product-service concept. For example, which type of capabilities and institutional back-up does an ICT company require preventing rematerialisation of virtual products causing negative second order environmental impacts? Only vague answers such as “better understanding of consumer behaviour or CRM is required can be given”. Research shall further be done to understand particular organisational capabilities required to address sector specific concerns. This information can then be fed into feasibility assessment tool.

The “TBL Significance Scanning Tool” and the “TBL Capability Scan Tool” can be valuable sources also for other sectors. In the first tool, the impact points surely have to be adapted according to the priorities and stakeholder concerns in the relevant sector. On the other hand, the second tool can adapted according to the specific capability requirements of each sector. Even in this case, the list is neutral and has been not adapted to the ICT sector specific capabilities. A further research on these capabilities might also provide setting up the initial links between the impact side and the capability requirement as discussed in the previous point.

A final reflection is that even the state-of-art criteria collected for capability scanning does not correctly assess dynamic capabilities of organisations. For example, organisational learning for TBL innovations is understood simply in terms of employee training or teamwork practices. Learning to carry out innovations is mentioned as much more complex processes (Senge, 1990; Agyris, 1993) and we believe that it is very much sector specific or organisation specific as it is linked to static capabilities.
References


