

Environmental sustainability and supply chain management –

A framework of cross-functional integration

Dorli Harms

Centre for Sustainability Management (CSM)
Leuphana University Lüneburg
Scharnhorststr. 1, D-21335 Lüneburg, Germany
dharms@uni.leuphana.de; Tel.: +49 4131 677-2248

February, 28th 2011

* Submitted to the 7th International Environmental Management Leadership Symposium, Rochester Institute of Technology in Rochester, New York (USA), May, 2nd–3rd 2011.

Keywords: Environmental sustainability; Sustainable supply chain management; Cross-functional integration; Knowledge-based theory; Conceptual paper

The purpose of this paper is to investigate intra-organizational structures of sustainable supply chain management (SSCM). The paper develops a conceptual framework of cross-functional integration with a focus on knowledge transfer.

SSCM, understood as the integration of supply chain management and environmental, social, and economic issues, has received increasing interest in research and in corporations (Carter & Rogers, 2008; Seuring & Müller, 2008). Analyzing SSCM in more detail uncovers various external and internal challenges a focal company (the company that controls the supply chain; Seuring & Müller, 2008) has to cope with: it seems unlikely that a company can control all processes of production of semi-manufactured parts and the related environmental and working conditions across the whole supply chain (Roberts 2004, 3; Piplani et al., 2008).

Another challenge is that customers and media are increasingly interested in product properties and services as well as in production conditions along the supply chains which can create pressure for companies to deal with SSCM (Carter & Dresner, 2001; Koplin et al., 2007). In turn, however, these topics can also create corporate opportunities. Companies which consider sustainability issues in their procurement or which offer innovative products and services can create business opportunities by fulfilling the demand for socially responsible products and services (Geffen & Rothenberg, 2000; Kassinis & Soteriou, 2003; Carter & Jennings, 2004). To cope with these challenges, the purchasing department is not only involved in an ongoing dialogue with its suppliers; but also – as supply chain processes are also relevant for functional units within the company (Lambert et al., 1998) – in a dialog with company-internal departments such as the environmental department, R&D, or marketing (in order to collect and discuss the – sometimes competing – sustainability-related demands by customers and other external stakeholders). In other words, an external and the internal supply chain can be distinguished. *External supply chains* are characterized by the flow of materials, capital and information between the different partners (suppliers, focal company, retail, consumers, disposal/recycling), whereas *internal supply chains* encompass the interaction between the different functional units in the (focal) company (Lambert et al., 1998; Seuring & Müller, 2008). This raises the following question:

How can the activities of different functional units be aligned in SSCM?

More specifically, this article deals with two detailed questions:

- 1) *From a SSCM perspective, which kind of knowledge has to be managed to improve cross-functional integration?*
- 2) *What are practices and tools to manage SSCM relevant knowledge?*

To answer these questions a conceptual framework is developed. When intra-organizational knowledge transfer (Grant, 1996; Sveiby, 2001) and cross-functional integration (Crittenden,

2011) are analyzed, such an integrated approach can help to respond to the above mentioned SSCM challenges. Building on this, the paper will concentrate on practices and tools which are beneficial for intra-organizational integration and for knowledge transfer between the different functional units to achieve SSCM goals. For instance, such goals are the development environmental friendly products or the reduction of waste across the supply chain.

Up to now, few papers discuss the necessity to address the intra-organizational alignment of departments to effectively manage the supply chain in sustainability terms (e.g. Pagell & Wu, 2009; Peters, 2010). However, they do not aim at building a theoretical framework with a focus on the transfer of knowledge within the organization. Further, various scholars underline the importance of cross-functional integration to manage environmental and sustainability issues, however, not in the context of SCM (e.g. Bannerjee, 2001). Other publications deal with cross-functional integration in conventional SCM, however, neglecting the environmental or sustainability management perspective (Sherman et al., 2000; Pagell 2004). To bring these different perspectives together, this paper focuses on the combination of literature from SSCM, cross-functional integration, and knowledge transfer.

Esper et al. (2010) deal with the internal demand-focused and supply-focused processes. This means, that the knowledge regarding the demand side (customer-oriented) and the knowledge regarding the supply side (supplier-oriented) can be transferred internally, in order to overcome the isolation of both sides (Esper et al., 2010). From a SSCM perspective, therefore, departments such as environmental management, purchasing, marketing, R&D, and production can collaborate through cross-functional mechanisms.

As cross-functional interaction within companies is highly complex (Brettel et al., 2011) information and knowledge flows should be managed purposefully. In this context, knowledge means organized, synthesized, or summarized information (Liebowitz, 2003). The

knowledge-based theory (Grant, 1996) emphasizes the role and high relevance of knowledge for a company to create competitive advantage. In the context of SSCM and intra-organizational integration, knowledge sharing and distribution are crucial. Sveiby (2001) distinguishes between three types of knowledge distribution: knowledge has to be transferred across internal structures, external structures, and individual competences. In this context, one goal of an effective knowledge transfer is to secure a match of information and material flows along the supply chain. Thus, for SSCM, both literature streams can be merged to investigate cross-functional integration. For the development of the proposed approach Sveiby's model will be used and extended conceptually. Finally, practices and tools of intra-organizational SSCM will be analyzed based on the developed conceptual framework.

References

- Bannerjee, S.B. (2001): Managerial perceptions of corporate environmentalism: Interpretations from industry and strategic implications for organizations. *Journal of Management Studies*, Vol. 38, No. 4, 489–513.
- Brettel, M.; Heinemann, F.; Engelen, A. & Neubauer, S. (2011): Cross-Functional Integration of R&D, Marketing, and Manufacturing in Radical and Incremental Product Innovations and Its Effects on Project Effectiveness and Efficiency. In: *Journal of Product Innovation Management*, Vol. 28, No. 2, 251–269.
- Carter, C.R. & Dresner, M. (2001): Purchasing's Role in Environmental. Cross-Functional Development of Grounded Theory. In: *Journal of Supply Chain Management* , Vol. 37, No. 3, 12–27.
- Carter, C.R. & Jennings, M.M. (2004): The Role of Purchasing in Corporate Social Responsibility. A Structural Equation Analysis. In: *Journal of Business Logistics*, Vol. 25, No. 1, 145–186.
- Carter, C.R. & Rogers, D.S. (2008): A framework of sustainable supply chain management. Moving toward new theory. In: *International Journal of Physical Distribution & Logistics Management*, Vol. 38, No. 5, 360–387.
- Crittenden, V.L.; Crittenden, W.F.; Ferrell, L.K.; Ferrell, O.C. & Pinney, C.C. (2011): Market-oriented Sustainability. A Conceptual Framework and Propositions. In: *Journal of the Academy of Marketing Science*, Vol. 39, No. 1, 71–85.
- Esper, T.L.; Ellinger, A.E.; Stank, T.P.; Flint, D.J. & Moon, M. (2010): Demand and Supply Integration. A Conceptual Framework of Value Creation Through Knowledge Management. In: *Journal of the Academy of Marketing Science*, Vol. 38, No.1, 5–18.

- Geffen, C.A. & Rothenberg, S. (2000): Suppliers and environmental innovation. The automotive paint process. In: *International Journal of Operations & Production Management*, Vol. 20, No. 2, 166–186.
- Grant, R.M. (1996): Toward a Knowledge-Based Theory of the Firm. In: *Strategic Management Journal*, Vol. 17, Winter Special Issue, 109–122.
- Kassinis, G.I. & Soteriou, A.C. (2003): Greening the Service Profit Chain. The Impact of Environmental. Management Practices. In: *Production and Operations Management*, Vol. 12, No. 3, 386–403.
- Koplin, J.; Seuring, S. & Mesterharm, M. (2007): Incorporating sustainability into supply management in the automotive industry. The case of the Volkswagen AG. In: *Journal of Cleaner Production*, Vol. 15, No. 11, 1053–1062.
- Lambert, D.M.; Cooper, M.C. & Pagh, J.D. (1998): Supply Chain Management. Implementation Issues and Research Opportunities. In: *International Journal of Logistics Management*, Vol. 9, No. 2, 1–20.
- Liebowitz, J. (2003): A knowledge management implementation plan at a leading US technical government organization. A case study. In: *Knowledge and Process Management*, Vol. 10, No. 4, 254–259.
- Pagell, M. (2004): Understanding the factors that enable and inhibit the integration of operations, purchasing and logistics. In: *Journal of Operations Management*, Vol. 22, No. 5, 459–487.
- Pagell, M. & Wu, Z. (2009): Building a More Complete Theory of Sustainable Supply Chain Management Using Case Studies of 10 Exemplars. In: *Journal of Supply Chain Management*, Vol. 45, No. 2, 37–56.
- Peters, N. (2010): Design of voluntary sustainability initiatives for supply chains. In: Ronald Bogaschewsky, R.; Michael, E.; Lasch, R. & Stölzle, W. (Hrsg.): *Supply Management Research. Aktuelle Forschungsergebnisse 2010*. Wiesbaden: Gabler, 61–94.
- Piplani, R.; Pujawan, N. & Ray, S. (2008): Sustainable Supply Chain Management, *International Journal Production Economics* 2008, Vol. 111, No. 2, 193-194.
- Roberts, S. (2004): Supply Chains as a Lever for Sustainability. Progress, Prospects and Pitfalls. In: Sumati, R. & Seuring, S. (Hrsg.): *Corporate social responsibility. Sustainable supply chains*. Hyderabad: ICFAI Books, 1–18.
- Seuring, S. & Müller, M. (2008): From a Literature Review to a Conceptual Framework for Sustainable Supply Chain Management. In: *Journal of Cleaner Production*, Vol. 16, No. 15, 1699–1710.
- Sherman, J.D.; Souder, W.E. & Jenssen, S. A. (2000): Differential Effects of the Primary Forms of Cross Functional Integration on Product Development Cycle Time. In: *Journal of Product Innovation Management*, Vol. 17, No. 4, 257–267.
- Sveiby, K.-E. (2001): A knowledge-based theory of the firm to guide in strategy formulation. In: *Journal of Intellectual Capital*, Vol. 2, No. 4, 344–358.

Curriculum Vitae

Personal data

Dipl.-Kffr. Dorli Harms

Born August, 5th 1978 in Uelzen, Germany

Centre for Sustainability Management (CSM)

Leuphana University Lüneburg

Scharnhorststr. 1

D-21335 Lüneburg, Germany

E: dharms@uni.leuphana.de

T: +49 (0)4131 677-2248, F: -2286



Academic education

| | |
|----------------------------------|---|
| 10/09 – present | PhD studies at the Centre for Sustainability Management (CSM), Faculty of Sustainability Sciences, Leuphana University Lüneburg Thesis “Forms of interaction in sustainable supply chain management. Inter- and intraorganizational perspectives“ |
| 08/09 – present 05/08 – 03/09 | Research assistant (half time) at the Centre for Sustainability Management (CSM), Leuphana University Lüneburg |
| 04/06 – 02/08 | Masters’ Degree Business Administration (Diplom Kauffrau) at the Leuphana University Lüneburg Mayors Spanish and Environmental Management; Grade: 1,9 Thesis “Corporate Social Responsibility and Corporate Culture. Samples from the Chemical Industry“ |
| 09/07 | Student assistant for the project “Latin American MBA programme“ at the Centre for Sustainability Management (CSM), Leuphana University Lüneburg |
| 10/05 – 02/06 | Visiting scholar within the Erasmus programme at the Universidad de La Rioja in Logroño (Spain) |
| 10/04 – 09/05 | Basic studies in Business Chemistry at the Westfälische Wilhelms-University Münster |
| 04/03 – 09/04 | Basic studies in Business Administration at the Leuphana University Lüneburg, while working full time, B.A. (Vordiplom) |
| 10/99 – 09/02 | Dual study program Business Administration (Betriebswirtin) at the Hamburg Academy of Business Administration and Shell & DEA Oil GmbH, Hamburg, Grade: 2.0 |

Professional experiences

| | |
|-----------------|--|
| 05/08 – present | Management assistant (half time) at ifu Institut für Umweltinformatik GmbH, Hamburg |
|-----------------|--|

| | |
|---------------|---|
| 04/07 – 07/07 | Internship in the international sales and marketing department at Carl Kühne KG (GmbH & Co.), Hamburg |
| 06/05 – 09/05 | IT-Trainer for Microsoft Office at Vastbau GmbH, Gronau |
| 10/02 – 09/04 | Administrator for remuneration and personal marketing in the HR department at RWE Dea AG, Hamburg |
| 10/99 – 09/02 | Trainee at RWE Dea AG, Hamburg in combination with the Hamburg Academy of Business Administration |
| 10/01 – 12/01 | Internship in the Controlling and Taxes departments at the German-Swedish Chamber of Commerce, Stockholm (Sweden) |

Research projects

| | |
|---------------|---|
| 10/09 – 12/10 | Project “Corporate sustainability barometer” in cooperation with PricewaterhouseCoopers AG |
| 08/09 – 09/09 | Project “Compendium of sustainability management tools for the public sector” commissioned by the German Council for Sustainable Development |
| 05/08 – 03/09 | Project “Sustainable supply chain management – State of SSCM in German companies” funded by The German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety |

Publications

Journals

- Hansen, E.G.; Harms, D. & Schaltegger, S. (forthcoming, 2011): Sustainable Supply Chain Management im globalen Kontext. Praxisstand des Lieferantenmanagements in DAX- und MDAX-Unternehmen. In: *Die Unternehmung*.
- Harms, D.; Windolph, S.E. & Schaltegger, S. (2010): Corporate Sustainability Barometer. Nachhaltigkeitsmanagement auf dem Vormarsch. In: *Ökologisch Wirtschaften*, No. 4/2010, 10.

Contributions in edited volumes

- Harms, D., Hansen, E.G. & Schaltegger, S. (forthcoming, 2011): Sustainable Supply Chains im globalen Kontext – Lieferantenmanagement in DAX- und MDAX-Unternehmen. In: Bogaschewsky, R.; Eßig, M.; Lasch, R. & Stölzle, W. (Hrsg.): *Supply Management Research. Aktuelle Forschungsergebnisse 2011*. Wiesbaden: Gabler.

Monographs

- Schaltegger, S. & Harms, D. (2010): *Sustainable Supply Chain Management. Praxisstand in deutschen Unternehmen*, Lüneburg: CSM, Leuphana Universität Lüneburg.
- Schaltegger, S., Windolph, S.E. & Harms, D. (2010): *Corporate Sustainability Barometer 2010. Wie nachhaltig agieren Unternehmen in Deutschland?* Lüneburg/Frankfurt a.M.: Centre for Sustainability Management der Leuphana Universität Lüneburg/PricewaterhouseCoopers.
- Schaltegger, S., Haller, B., Müller, A., Klewitz, J. & Harms, D. (2009): *Nachhaltigkeitsmanagement in der öffentlichen Verwaltung. Herausforderungen, Handlungsfelder und Methoden. Studie im Auftrag des Rats für Nachhaltige Entwicklung der Bundesregierung*, Lüneburg: Centre for Sustainability Management.

Conferences

| | |
|-------|--|
| 10/10 | “VHB Herbst-Tagung, Kommission Nachhaltigkeitsmanagement“ September, 30 th - October, 1 st 2010 at the University Kassel Presentation “Sustainable Supply Chain Management Empirische Studie bei DAX & MDAX – Praxis & Theorie” |
| 03/10 | “6 th Environmental Management Leadership Symposium: Advancing the profession - From environmental to sustainability management” March, 20 th - 22 nd 2010, at the Centre for Sustainability Management (CSM), Leuphana University Lüneburg Member of the organizing committee |
| 11/07 | “Business Case for Sustainability“ November, 16 th - 17 th 2007, at the Leuphana University Lüneburg Member of the organizing committee |
| 12/06 | “First International Congress on Oasis and Sustainable Tourism”, December, 14 th - 16 th 2006, Elche (Spain) Attendance |

Language skills

| | |
|---------|---|
| German | Primary |
| English | Conversational and written; TOEFL and SEFIC certificates |
| Spanish | Conversational and written; Certificado Superior de Español de los Negocios |
| French | Basic Knowledge |

IT skills

MS-Office-Paket, SPSS, SAP, Lotus Notes, Gauss Intranet

Pre-professional qualification

| | |
|---------------|---|
| 07/99 – 08/99 | Business English Courses at Berlitz, London (UK) and Singapore |
| 04/99 – 06/99 | Internship at the A. Gubbe, Uelzen |
| 01/99 – 03/99 | Excursion and language-learning travel through New Zealand |
| 10/98 – 12/98 | Laboratory assistant at Nordzucker AG, Uelzen |
| 07/98 – 09/98 | Working student at Volkswagen AG, Hannover |

Further education

| | |
|-------|--|
| 12/04 | Local training course “Management Training” Participant and member of the European student organization AEGEE Münster e.V. |
|-------|--|

02/02

Qualification course for instructors
at the Chamber of Commerce and Industry, Hamburg

Interests

Sports (Judo, Running), Traveling, Literature

Lüneburg, February, 28th 2011