Contribution of Emerging IT Solutions to Sustainable Logistics and Supply Chain Management – a Theoretical Framework Analysis

Iris HAUSLADEN[1], Alexander HAAS[1] and Andrej LICHTENBERG[1]

[1] HHL Leipzig Graduate School of Management, Heinz Nixdorf Chair of IT-based Logistics, Leipzig, Germany

Abstract—Emerging IT solutions like cloud computing or service-oriented architecture (SOA) are beginning to spread in all industries nowadays. Especially in the area of logistics and supply chain management, these solutions enhance business by using common data formats, modular and flexible IT tools, real-time tracking as well as real-time reaction. Previous literature contributions investigate the usage of these technologies mostly from a technical or cost-oriented perspective to analyze the possibility of usage or to explore cost advantages. An investigation that integrates an environmental or social perspective has, however, not been done before, although research on sustainable logistics and supply chain management is in strong demand today. In this paper, we want to develop an analysis framework to map selected logistics and supply chain processes (LSCP) with corresponding emerging IT solutions to create a better understanding of their role in sustainable logistics and supply chain management. Initially, these LSCP are systemized with the aid of the main SCOR processes Source, Make, Deliver and Return. Subsequently, the SCOR-aligned LSCP are selected concerning their IT- and sustainability potential through a two-step portfolio approach under application of predefined criteria derived from the triple bottom line (TBL). After this procedure, TBL-aligned requirements for a sustainable LSCP are mapped with emerging IT solutions to elaborate their contribution to sustainability. The aim of this framework is to achieve an overview about if and how a certain emerging IT solution can increase the sustainability of a logistics or supply chain process. At first, contribution to literature is made by a systematic selection of the LSCP using the SCOR model and the TBL as established standards. Furthermore, an analysis approach to investigate the role of emerging IT solutions for sustainable LSCP is presented and could be used as a component to research a holistic IT support in logistics and supply chain management.

Key words—analysis framework, IT solutions, logistics and supply chain management, sustainability.

AUTHORS

Iris Hausladen is chairholder of the Heinz Nixdorf Chair of IT-based Logistics, HHL Leipzig Graduate School of Management, 04109 Leipzig, Germany (e-mail: iris.hausladen@hhl.de).

Alexander Haas is research associate at the Heinz Nixdorf Chair of IT-based Logistics, HHL Leipzig Graduate School of Management, 04109 Leipzig, Germany (e-mail: alexander.haas@hhl.de).

Andrej Lichtenberg is research associate at the Heinz Nixdorf Chair of IT-based Logistics, HHL Leipzig Graduate School of Management, 04109 Leipzig, Germany (e-mail: andrej.lichtenberg@hhl.de).