

Sustainability through improving information infrastructures: A Revelatory Case Study of International Shipping

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EXTENDED ABSTRACT

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INTRODUCTION

This paper reports empirical research on information infrastructures in the domain of international trade towards a more sustainable world. The revelatory case study presented here is about an international shipping company's initiative to research the sustainability impact from developing a common and shared information infrastructure for international trade.

With regard to sustainability, IS researchers have been slow to acknowledge the problem and to take action (Watson, Boudreau, & Chen, 2010). This paper attempts to employ the concept of information infrastructure in IS research projects on sustainability whereby IS research potentially can contribute to a more sustainable world.

The revelatory case study of the sustainability strategy for an international shipping line provides evidence from the initial project to build a sustainability strategy where common and shared information infrastructures become an important element for trade facilitation by lowering the administrative trade barriers and increasing collaboration.

This paper claims that improved and shared information infrastructures can contribute significantly to sustainability. An impact which potentially can be compared to the impact information systems have had on productivity gains in the last decades.

BACKGROUND

The United Nation (UN) is pursuing an agenda for a better world for people with regard to health and prosperity, and for the planet. The UN is in process to develop a set of sustainable development goals (SDGs) to replace the so-called Millennium Development Goals (MDGs) that run out in 2015. These are global goals that the UN will try to rally both business and governments around. The agenda includes 169 targets whereof an expert panel as part of the Post 2015 Copenhagen Consensus has identified 19 targets with “the best value-for-money in development over the period 2016 to 2030”¹. Trade is identified as one of the means to reach the targets, because it’s estimated to “return ~\$2000 to the world for every dollar spent and ~\$3,400 to developing countries as a group for every dollar spent.”(Lomborg 2015). The question asked is if trade can lift a staggering 160 million people out of extreme poverty? Kym Anderson: “Pre-announced, gradual reductions in trade barriers, especially if agreed multilaterally under the WTO’s DDA, would yield huge economic benefits and relatively little economic cost... Moreover, the net social and environmental effects of such reform also would be very positive, assisting in the achievement of several of the other targets in the UN’s Post-2015 agenda.”² Further the argument for focusing on trade as one of the highest prioritized targets is that focus on reducing the costs of trading would allow governments to work with stakeholders to reduce all the barriers to trade including domestic policies, non-tariff measures and trade infrastructure. (Hoekman)

THEORY

On top of the management’s agenda is how to create synergy between their strategic initiatives and supporting sustainable development in the world. Large global companies take on their Corporate Social Responsibility (CSR) and the sustainability challenge³ (Brundtland, Environment, & Development, 1987), they want to impact the world in a sustainable way by

¹ <http://www.copenhagenconsensus.com/post-2015-consensus/nobel-laureates-guide-smarter-global-targets-2030>

² Complete the languishing Doha Development Agenda process at the World Trade Organization
<http://www.copenhagenconsensus.com/post-2015-consensus/trade>

³ Sustainable "development that meets the needs of the present without compromising the ability of future generations to meet their own needs."

setting and pursuing their sustainability strategy. One of the more influential and recent theories within the sphere of CSR is developed by Michael Porter and Mark Kramer. They extend the classic CSR approach from only looking into how companies can mitigate their negative impact on society – to how a company can integrate such considerations as part of their business strategy and gain competitive advantages. “Each company can identify the particular set of societal problems that it is best equipped to help resolve and from which it can gain the greatest competitive benefit.” (Porter & Kramer)

IS researchers have been slow to acknowledge the sustainability and to take action as pointed out by Watson and colleagues (Watson et al., 2010). A recent basket of eight journals call for papers for a special issue focusing on sustainability and “encourage authors to undertake research that can contribute to the solution of environmental problems” understood as IT solutions to measure environmental impacts. However, utilizing IT as a means to positively impact sustainability was not within the scope.

Within international trade, the information exchange has not utilized the modern possibilities of IT and is still to a large extent based on paper documents which in fact become a barrier for international trade. Analysis of current information infrastructure indicates a complex business ecosystem with an unleashed potential for improvement (Jensen, Tan, & Bjørn-Andersen, 2014) and that the information infrastructure for the trade of avocados from Kenya to Europe is missing (Jensen, Bjørn-Andersen, & Vatrapu, 2014). The international trade administrative cost for crossing borders is significant, at least twice the transportation cost (Anderson & Van Wincoop, 2004). By utilizing the internet for information exchange for international trade those barriers can be lowered. Additionally an information infrastructure for international trade could facilitate and trace documentation of fair trade.

Inter-Organizational Systems (Kaniadakis & Constantinides) play an important role for exchange of information among organizations involved in international trade around the world. Extant literature regarding the utilization of IT for collaboration across organizational boundaries and national borders is primarily focused on IOS (Kaniadakis & Constantinides, 2014). The extant literature regarding IOS employs more than 25 theories (Madlberger & Roztockki, 2008) and no single theory stands out as predominant. The majority of research regarding IOS is focused on EDI (Reimers, Johnston, & Klein, 2004), and a majority of the described IOS are successfully

utilizing EDI (Robey, Im, & Wareham, 2008). For international trade, the benefits of facilitating IOS based on EDI are well documented (J. King & B. R. Konsynski, 1990; King, 2013; J. L. King & B. R. Konsynski, 1990) and it has also been pointed out that changes are relatively costly (Henningsson & Bjørn-Andersen, 2009). Recent research projects have revealed the potential benefits for actors involved in international trade by utilizing IOS based on EDI messages for collaboration across organizational boundaries, for example ITAIDE project (Tan, 2010), Contain project⁴, Integrity project⁵, and Cassandra project⁶.

Improved infrastructures remove barriers and positively influence a better and more sustainable world where more people have a better life (O'Sullivan & Sheffrin, 2007). Infrastructures include both physical infrastructures such as roads, ports, shipping routes, and information infrastructures (Fulmer, 2009). Information infrastructures utilize the fundamental information communication technologies and electronic infrastructure (e.g. broadband) that are rapidly diffusing enhancing economic growth and performance (Gholami; Gholami, Higón, Hanafizadeh, & Emrouznejad, 2010). Obvious national information infrastructures have to be linked into global networks (Pipe, 1995). The internet (World Wide Web) is the best known and probably most successful information infrastructure (Star & Ruhleder, 1996) influencing global information exchange and making "the world flat" (Friedman, 2005). An information infrastructure is "*a shared, open (and unbounded), heterogeneous, and evolving socio-technical system consisting of a set of IT capabilities and their users, operations, and design communities*" (Hanseth & Lyytinen, 2010). Infrastructures are characterized by being widely shared and will become part of the general business infrastructure.

METHOD

The case study method is chosen because international trade is extremely complex and to a large extent academically unexplored from an IS perspective. With a case study method it is possible to investigate a contemporary phenomenon in depth and within its real-life context (Yin). An in-depth understanding of the details is needed in order to understand the complexity and the issues causing the barriers for international trade. The case study is here defined as an empirical inquiry

⁴ <http://www.containproject.eu/>

⁵ <http://www.integrity-supplychain.eu/> 20150303

⁶ <http://www.cassandra-project.eu/downloads/> 2015030

that potentially can help to explain presumed causal links in real-life interventions that are too complex for the survey or experimental research methods (Flyvbjerg). The overall results of the case study are rather robust meeting the methodological guidelines suggested in literature (Herriott & Firestone, 1983). Accordingly, the research results will be rather generally applicable, but this will need to be verified in follow up research.

ANALYSIS

The case company is a global company that has focus on establishing a sustainability strategy with actions and investments focused at long term sustainable solutions to the critical problems which the world faces.

The case company's long-term strategy is described as: "Unlocking growth for society and the company committed to long-term development. Achieving long-term benefits, the company strives to create long-term value by balancing social and environmental responsibility in all business processes with the need to remain commercially successful."⁷ By being one of the world's leading shipping companies addressing sustainability challenges, potential impacts can be significant both for the global society and for the company. The CEO states "We have the ability – and the responsibility – to do things right and to contribute to a more sustainable future." The sustainability strategy contains three elements: "Energy efficiency, investing in education, and enabling trade, which impact respectively the society and the company with CO₂ reduction and cost savings, economic growth and (trade) volume, and increase jobs and skilled workers (employees)". The leading shipping company has invested in development and purchase of twenty new container vessels that "reduce carbon dioxide emissions by about 50 percent per container moved and the fuel consumption by 37 percent"⁸ which has a positive effect on both environment and saves cost at the same time. The leading shipping company is ready for the next move and wants to research possible initiatives focused on the other legs in their strategy. In their annual report is stated: "An objective is to improve the way information is exchanged and processed in container shipping."⁹ They have engaged with World Economic Forum and want to

⁷ <http://www.maersk.com/en/industries> 20150303

⁸ http://en.wikipedia.org/wiki/Maersk_Triple_E_class 20150303

investigate how to support developing countries to grow in a sustainable way based on enabling increased international trade.

Improved infrastructures are a societal key to enabling efficient and effective trade for a society. The challenge is to establish and evolve the infrastructures to be more sustainable. The leading shipping company has decided that the first two years of the strategy will focus on designing and implementing projects that can be scaled up across growth markets where feasible. The first selected project focuses on establishing and improving information infrastructure for international trade from East Africa to Europe.

The knowledge and focus of the companies and organizations involved are on information systems and not Information Infrastructures wherefore IS research can potentially contribute with applicable knowledge regarding information infrastructures (Hanseth & Lyytinen, 2010) e.g. the issue designing information infrastructure (Ribes & Finholt, 2009), the use of identifiers (Eriksson & Ågerfalk, 2010) and information infrastructure cultivation (Hanseth, 2010). Inspired by Melville' belief-action-outcome framework (Melville, 2010) and by Gholami's use of a design science approach (Gholami & Helfert, 2012), the action and research proposed is a pilot project, approved by a dedicated management council within the case study company. The pilot project first analyzes the sustainable values, altruism and intentions of the actors involved, and secondly demonstrates the potential of using an information infrastructure for a specific trade lane of fresh products from East Africa to Europe. Thereby this revelatory case study is an example of IS research's contribution to a sustainable strategic initiative.

IMPLICATIONS

Improved Information Infrastructures (II) can contribute significantly to sustainability. II is estimated to reduce trade cost enabling export from developing countries and increase of trade especially for small and medium sized companies is estimated to positively affect the local society and their wealth.

Lowering trade barriers for international trade to best practices is estimated by World Economic Forum (WEF, 2013) to impact international trade and GDP significantly, an improvement halfway to regional best practices is estimated to have a greater effect than removing all tariffs.

⁹ Page 24 in Maersk Group Annual Report 2014 <http://investor.maersk.com/financials.cfm> 20150303

APPENDIX

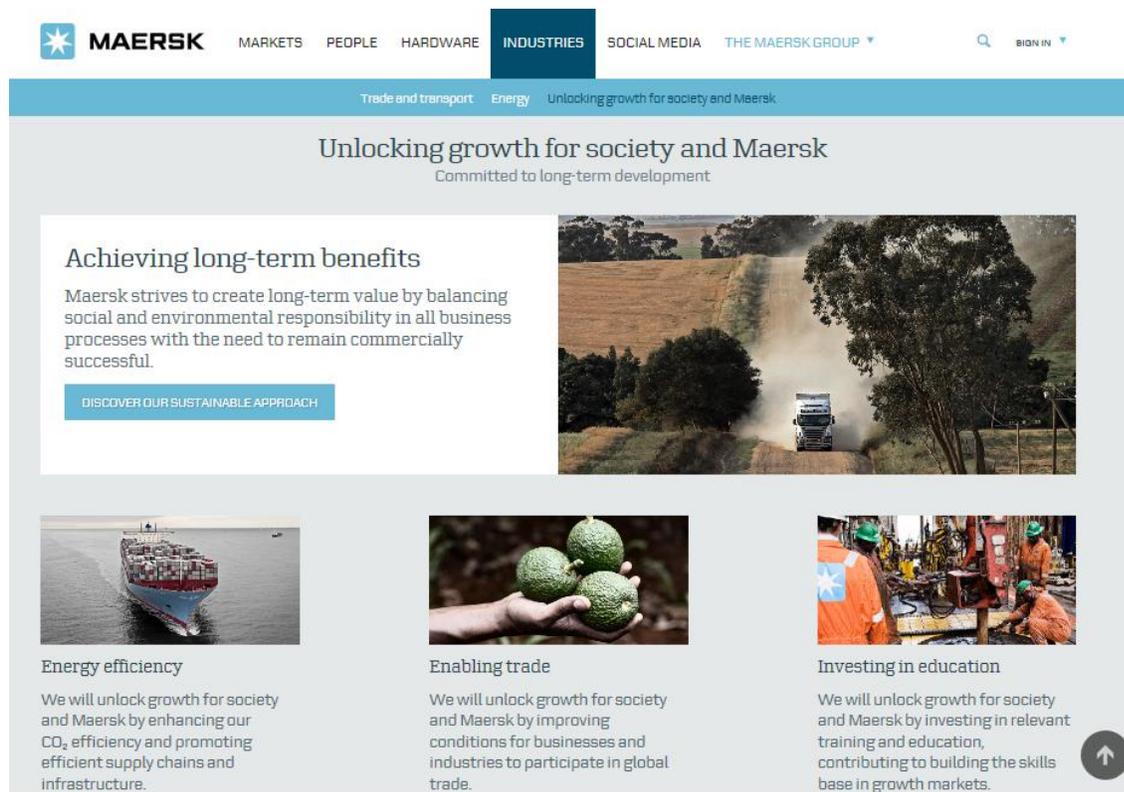


Figure 1. Case company web page regarding sustainability¹⁰

¹⁰ <http://www.maersk.com/en/industries> 20150303

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