
Introduction: Decision-making in sustainable supply chain design and practice

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As described in Part 1 of this special issue (Butcher and Dwivedi, 2012), we sought contributions that explore contemporary supply chain designs and practices that can achieve longevity and sustainability. We framed this statement in the current global conditions of ever-increasing market volatility, global competitive pressures, and events such as the ongoing global economic crisis. Hence, we adopt a holistic perspective of sustainability in the supply chain context. That being sustainability not merely meaning

'green' but embracing all factors that must be considered when assessing the impact of supply chain designs and practices on the environment, society and economy.

We invited theoretical and empirical submissions relating to sustainable supply chain issues. In so doing, one of our objectives was to provide a roadmap to developing future research into designing supply chains for sustainable supply and developing adaptable, agile management practices that will outlast short- and long-term shifts in supply and demand. We received a far greater response than was expected and have been able to span two issues of this volume of the *International Journal of Agile Systems and Management*. In so doing, we have grouped the contributions into two categories, namely: *preparedness for sustainability* (the previous Part 1), and *decision-making for sustainability* (this Part 2).

Following on from the previous issue this Part 2 provides four contributions that again pick up on the notions of vulnerability and volatility in supply chains, but hone in on decisions to combat them. In 'The links between supply chain disturbances and resilience strategies', Carvalho, Maleki and Cruz-Machado identify typical supply chain disturbances and firms' approaches to overcoming the negative impacts of those disturbances. From classifications of disturbances and responses, the authors frame their findings via a conceptual model, which they propose might form a basis for further research.

The three other contributions explore location and transport decisions for more sustainably designed supply chains. In 'Sustainable supply chain by intermodal itinerary planning: a multiobjective ant colony approach', Sawadogo and Anciaux model intermodal transport decisions with a view to reducing the environmental impact of a supply chain. Their novel approach provides a decision support tool to determine the 'shortest path' not in terms of time and cost, but in terms of minimising impact. In 'Production location and sustainability' Theyel examines the connection between local collaboration and innovation. This UK-based study interviewed senior executives from more than 50 manufacturing firms to find that localised agglomeration positively influences innovation. As such it is inferred that the resultant innovation offers those manufacturers long-term viability and thus sustainability. Returning to transport decisions, Vilko, Alve, Soukka and Hallikas examine routing decisions in 'Selecting the supply chain route: environmental aspects'. Using an analytic hierarchy process (AHP), the authors examine the environmental impacts of re-routing scenarios due to the closure of the Port of Kotka in Finland. In this case, they find that environmental impact assessment was not high on the agenda of decision-makers and suggest such considerations should be.

Over the two issues, the eight contributions highlight a disparity between the need for sustainable supply chain design and practice, and the ability to achieve it at present. *Preparedness* in practice would appear still to be a concern. Yingvilasprasert et al. (2012) and Vlachos et al. (2012) highlight that there is still much to research in the area of supply chain risk management. Furthermore, the evidence from Italian fashion manufacturing and UK construction illustrate that despite initiatives to implement more responsible practices, few practitioners are aware of how they should achieve them (Bigliardi and Bottani, 2012; Glass et al., 2012). Hence, that apparent lack of preparedness inevitably impacts supply chain performance. Further research, it would seem, is essential to offer policymakers and practitioners clear guidance on the challenges they face in introducing more sustainable practices and how they might best respond.

In their response to supply chain issues, practitioners are faced with complex and multi-faceted decisions. *Decision-making* in supply chain management has conventionally focused on time and cost efficiencies but must shift to their environmental and societal impacts (Vilko et al., this issue). Indeed, effective decision-making can improve a supply chain's resilience (Carvalho et al., this issue). Decision support tools are one solution to complex problems such as intermodal transportation (Sawadogo and Anciaux, this issue). Collaboration is another (Theyel, this issue). Decisions to transition to more sustainable supply chain designs and practices are fundamental decisions. Further research into how policymakers and practitioners can make more responsible decisions is needed.

In these turbulent times we bear witness to environmental, societal and economic shifts not seen before. While these shifts impact supply chain designs and practices (Bigliardi and Bottani, 2012; Carvalho et al., this issue; Glass et al., 2012; Vilko et al., this issue; Vlachos et al., 2012) the converse is also true. How contemporary supply chains are designed and operated impacts the environment, societies and economies (Theyel, this issue); Sawadogo and Anciaux, this issue; Vilko et al., this issue; Yingvilasprasert et al., 2012).

In the introduction to Part 1, we align societal concerns alongside environmental and economic concerns to offer a more holistic perspective of sustainability (Butcher and Dwivedi, 2012). As a final comment, we find that few supply chain management researchers have turned their attention to the societal implications of supply chain designs and practices. In a globalised world where *choice* is what drives supply chain competition, societies are changing. Whether they be the consumer societies downstream of global supply chains or the production societies upstream, the imprint that contemporary supply chains are leaving on this earth is world-changing. It is therefore our contention that supply chain practitioners and researchers have a moral obligation to the societies they affect. The ethics of contemporary supply chain management is one subject that must be urgently and critically addressed for a truly sustainable future.

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