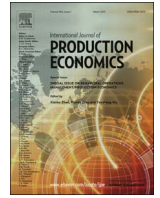




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Supply chain collaboration for sustainability: A literature review and future research agenda

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ABSTRACT

New technology is altering business strategies and innovation capabilities while increasing the possibilities of production and process innovation. Supply chain collaboration undertaken for the sake of sustainability is currently speeding up this process of change; a growing pool of research is exploring the links between sustainability collaboration and company performance on economic, environmental, and social metrics. It is a good time to review the literature to reveal what has been studied and what are the gaps in the current body of knowledge, and also to comment on what the future research agenda should include. For these purposes, the authors conducted a systematic literature review and a quantitative bibliometric analysis. Results indicate that research about supply chain collaboration for the purpose of sustainability is gaining growing attention in the business field; however, environmental and economic considerations still dominate the research, while there is a lack of consideration about social concerns such as child labor and personal development. In addition, the collaboration partners under investigation have mainly been the company and its customers and suppliers, whereas competitors and other horizontal collaboration partners have received little attention.

1. Introduction

Supply chain collaboration has become a strategic issue for companies that wish to achieve their economic, social, and environmental sustainability targets. Most researchers define supply chain collaboration as a partnership process in which no less than two independent parties work hand in hand to mastermind and execute supply chain operations for the fulfillment of common goals and mutual benefits (Cao and Zhang, 2011). This collaboration process may include governments and university/research institutes, which define development policies and contribute to the relevant R&D activities, respectively (Lee et al., 2010). Meanwhile, collaboration among multiple businesses for environmental improvements should be a key issue for a sustainable supply chain management (Lu et al., 2007).

The studies on supply chain management highlight the importance of coordination among companies. Soylyu et al. (2006) point out that supply chain collaboration is a common way for companies throughout the supply chain to share the information, make strategic alliances to improve performance, and reduce overall costs and inventories. The ultimate objective for supply chain collaboration is to increase a company's competitive advantage (Soylyu et al., 2006; Cao and Zhang, 2011).

Nowadays, companies must address external and internal concerns to become more environmentally and socially responsible while maintaining their responsibilities toward economic sustainability. Industrial practices increasingly emphasize that collaboration is a feasible means of balancing these three priorities. Such collaborations have expanded over time to include all the relevant parties of an industrial value chain. As the academic literature examining supply chain collaboration and sustainability is still in a relatively infantile stage (Linton et al., 2007), the time to undertake an in-depth analysis of the research to date is now. Such an analysis will allow academic and industrial practices move forward in tandem.

This paper focuses on the subject of sustainability and supply chain collaboration from a broad perspective that includes economic, environmental, and social aspects. The research objectives of this paper are to summarize the current state-of-the-art in the field of sustainability and supply chain collaboration research, as well as to identify what future research would best benefit the field. Thus, the research questions in this paper are:

- What are the state-of-the-art and existing trends in the research on sustainability and supply chain collaboration?

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- What gaps exist in the research, and what may be done to contribute to future research?

To address these questions, we scoured different databases to collect articles that fit the research objectives. Then we provided a comprehensive analysis of the current literature in supply chain cooperation and collaboration for the sake of sustainability and conducted a triangulation analysis of the literature to improve understanding of the current research situation. A systematic literature review and quantitative bibliometric analysis have been applied to improve the results of the analysis.

In this paper, we take a broad strategic perspective of sustainability and supply chain collaboration from both qualitative and quantitative views. There are some significant features in this review: i) it explicitly includes supply chain collaboration practices in terms of their ability to effect sustainability, ii) it considers sustainability from a broad viewpoint that includes not only economic aspects, but environmental and social factors as well.

Following the introduction chapter, the paper presents an overview of the review methodology. It then provides a classification scheme for the selected articles based on content analysis, and then illustrates the results of a bibliometric analysis that indicates the leading individual contributors and leading organizations in this field. We elaborated a conceptual framework that can help researchers to assess the relationship between sustainability and supply chain collaboration. From there, the paper provides a research agenda for the purpose of contributing the existing knowledge of industry and academia on the relationship between sustainability and supply chain collaboration.

2. Methodology

To address the research questions, we performed a thorough review on the literature relating to supply chain collaboration for the purpose of sustainability. The literature review team, made up of two senior researchers and two PhD students, held discussions and cooperated in all facets of this literature review. The four researchers performed independent work first, and then entered a panel discussion at every research step. This study followed the process recommended by Krippendorff (1980), which includes four steps: (i) data collection, (ii) descriptive analysis, (iii) categorization analysis, and (iv) data evaluation and interpretation.

2.1. Data collection

This study contains literature from 1987 to 2015, because 1987 was the year when the UN Brundtland Commission first officially introduced the sustainability concept (WCED, 1987). The process for data compilation followed the review methodology suggested by Andriolo et al. (2014), and is shown in Table 1. We collected articles from a selection of databases, including Scopus, Web of Science, and Business Source Premier. An expert panel discussion resulted in the creation of a table of selected keywords that would identify literature that fulfilled the requirements in the research objectives. The keywords can be divided into three categories:

1. Related words about supply chain
2. Related words about collaboration
3. Related words about sustainability

One example of a keywords combination would be “sustainability”+“supplier”+“integration”; another would be “green”+“supply chain” +“collaboration.” Table 1 shows all the selected keywords.

After clearly defining the research strategy, we conducted comprehensive systematic research to collect published journal articles and reviews in the operations management field from 1987 to 2015. Papers were collected from the main sources based on their appearing in the

search results of various databases as the result of entering the selected keywords. To test the relevance of the collected papers, each team member performed individual abstract analysis of all 1778 papers. Those papers focusing exclusively on the economic dimensions of sustainability or that had nothing to do with supply chain were excluded in order to highlight works on collaboration and comprehensive sustainability indicators. In the end, 174 papers were considered to be valid. The inter-rater agreement of all team members was 85%. These 174 papers were used for the bibliometric analysis to explore the structures and evolution of current research in sustainability and supply chain collaboration.

After selecting relevant papers and bibliometric analysis, however, we read the full texts of all 174 papers. We found that these 174 papers provided a suitable overview of the current state-of-the-art in the field of sustainability and supply chain collaboration. Thus, we included them in the following bibliometric analysis. However, when preparing the content analysis, we had a more specified aim in mind. The papers selected for content analysis had to answer at least one of the following questions:

- What are the most important factors determining whether a supply chain collaboration achieves sustainability?
- What are the relationships among these factors?
- What combination of factors leads to improved sustainability performance by companies?

We found that not all papers focused on the above-mentioned issues concerning collaborations for sustainability. After much discussion, we selected 90 papers for in-depth analysis and summary. The descriptive analysis and quantitative bibliometric analysis thus includes 174 papers, while the categorization analysis uses on the 90 papers that focused on the most relevant issues.

2.2. Descriptive analysis

We began by exploring the growth in research publications over time and the distribution of the papers among the various journals. Next, we conducted a bibliometric analysis using the Citespace program to reveal what authors were contributing most frequently and the degree to which the research on this topic was undertaken by means of collaborative networks. One of the most important aspects of this analysis was the co-author analysis.

2.3. Categorization analysis

Because categorization is a crucial approach to understanding the characteristics of different groups (Cohen and Lefebvre, 2005), we next analyzed the pool of research papers according to key research issues. The analysis included three structural dimensions: theories used, methodologies used, and supply chain collaboration practices for sustainability. The theory dimension provided categorization of papers based on what theories were used by the reviewed papers. The methodology dimension provided categorization of papers based on the methodologies used by reviewed papers, including survey, case, concept, and math. The dimension of supply chain collaboration practices for sustainability provided categorization of papers based on what practices were assessed. It was structured into five categories based on how partners and firm were collaborating: internal collaboration, collaboration with supplier, collaboration with customer, collaboration with competitor, and collaboration with other organizations.

2.4. Rigor of research process

The study's reliability was assured by involving two senior researchers and two Ph.D. students in all steps of the literature review; this follows the same principle espoused by Seuring and Müller (2008). We

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