Journal of Purchasing & Supply Management 21 (2015) 285–295

Contents lists available at ScienceDirect

Journal of Purchasing & Supply Management

journal homepage: www.elsevier.com/locate/pursup

The effect of early supplier engagement on social sustainability outcomes in project-based supply chains

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ARTICLE INFO

Article history:
Received 7 August 2014
Received in revised form
13 May 2015
Accepted 30 May 2015
Available online 9 June 2015

Keywords:
Sustainability
Supply chain management
Supply management
Environmental health and safety

ABSTRACT

This work uses a mixed methods research design to explore how social sustainability outcomes are impacted by early supplier integration and associated strategies for successfully implementing this integration. Much of the literature in the area focuses on environmental factors, while social sustainability factors such as worker and consumer safety have been underrepresented. The results quantitatively illustrate the positive effects on sustainable outcomes of making environmental, health, and safety (EHS) a decision factor earlier in the product lifecycle and of using early supplier involvement as an implementation strategy to accomplish this goal. More importantly, the results show that the suppliers that are being involved early are not always strategic suppliers as one would expect, but are often what are traditionally categorized as leverage suppliers. These results are relevant because they not only align with recent research in sustainable sourcing management, but also have practical implications for organizations trying to be successful in a triple bottom line environment.

1. Introduction

Whether it is through the lens of the triple bottom line, corporate social responsibility, integrated lifecycle management, or sustainable supply chains, there has been an increased focus in literature and practice on a broad perspective in which factors other than profit are important drivers of decision-making in the supply chain (Kleindorfer et al., 2005; Lindgreen and Swaen, 2010). One key element of these concepts is the recognition that the planning and implementation of such a strategy is largely an external activity, and firms must cooperate with stakeholders both upstream and downstream in order to achieve success. More specifically, research has discussed how addressing triple bottom line (TBL) issues during sourcing decisions should be an important component of an organization's social responsibility strategy (Carter and Jennings, 2004), as well as the performance benefits observed when upstream stakeholders are engaged early in environmental sustainability issues (Lee, 2008; Ofori, 2000).

Reviews by Kleindorfer et al. (2005) and Seuring and Müller (2008) have found that much of this research in the supply chain management domain has focused on the environmental aspects of sustainability and largely ignored social aspects. The social portion of the TBL is concerned with incorporating the impacts of products and services on stakeholders and consists of issues such as worker health and safety, human rights and equity, and basic needs fulfillment (Dreyer et al., 2006; Hutchins and Sutherland, 2008). Thus, there is an opportunity to assess how earlier integration of upstream stakeholders, such as suppliers, on social issues would generate performance benefits similar to those found through early supplier engagement on environmental issues. Early supplier engagement in this regard is defined as the involvement of a supplier organization in conceptual and design activities (Smith and Zsidisin, 2002).

The construction industry presents an opportunity to study the impact on supply chain level outcomes of considering social sustainability issues during the sourcing process. The social issue of worker safety is a relevant topic in this industry, as the construction industry had the highest number of fatalities, the fourth fatality highest incident rate, and a lost time rate (all common safety metrics) above the overall industry average of the United States in 2012 (Bureau of Labor Statistics, 2013a, 2013b). Incidents outside the construction industry, such as a deadly building collapse in Bangladesh of a supplier for Wal-Mart, Gap, and other major retailers (Mauldin and Kapner, 2013) and safety breakdowns

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http://dx.doi.org/10.1016/j.pursup.2015.05.004
1478-4092/

on the Deepwater Horizon oil drilling rig that sent BP into the "worst crisis in its 102-year history" (Chazan, 2010, p. 1), have also illustrated the supply chain level impacts of worker safety that can not only affect material flow but damage reputations as well.

This paper addresses these issues by considering the impact of early supplier engagement on the key social sustainability issue of worker safety. Using the context of the construction industry, this paper first describes the adversarial nature of stakeholders in the supply chain when it comes to the social component of the triple bottom line, even as supply chain literature in areas such as total cost of ownership and sustainability have illustrated the long-term benefits of collaboration and a lifecycle mentality. Based on a sample of 22 case studies, the evolution of what factors are driving decision-making over the lifecycle of a project is explored, including the benefits of considering social sustainability factors earlier in the supply chain and the extent to which engaging key suppliers earlier in the sourcing process can have benefits in this regard. Discussion then centers around an important issue for sourcing managers that was identified through analysis of the qualitative data, which is that the engagement of suppliers on these issues does not always align with previous procurement literature that promotes early engagement primarily on strategic purchases. Instead the cases reveal an interesting behavior by organizations in the sample that aligns with recent research by Pagell et al. (2010), who found organizations realized positive environmental sustainability outcomes through stronger, more strategic relationships with what have been traditionally categorized as commoditized suppliers.

2. Sustainable supply management in the construction supply chain

The emphasis on sustainability in modern supply chain management stems from the concept of interdependence, which drives firms to understand the requirements of stakeholders in their network in order to succeed long term (Savitz, 2013). This includes not only profitability needs of the organization and its investors, but also of the environment and people impacted by the operations of the organization (Elkington, 1999). The interdependence between the three can be seen through the lens of construction worker safety, as the societal impacts of an accident or fatality are easy to recognize in addition to the financial effects on the organization (Feng et al., 2015; López-Alonso et al., 2013). Issues such as these illustrate how sustainability initiatives can be "a source of opportunity, innovation, and competitive advantage", but the implementation of these initiatives are "so fragmented and so disconnected from business and strategy as to obscure many of the greatest opportunities for companies to benefit society" (Porter and Kramer, 2006, p. 2).

The type of fragmentation in the supply chain mentioned above has been extensively studied, as aligning multiple firms with diverse objectives can be complex. In fact, research has shown that in terms of barriers to a sustainable supply chain that there are as many barriers external to the organization as internal (Walker et al., 2008). One of the external interactions that has been shown to have an important impact on sustainable outcomes is the purchasing and supplier relationship. Authors such as Zsidisin and Siferd (2001), Bowen et al. (2001) and Foerstl et al. (2010) have all discussed the operational and reputational consequences of purchasing and supplier integration on a successful sustainability strategy. These articles lay a foundation of procurement as a boundary spanning function in organizations that holds a key to successful sustainability outcomes through the proactive engagement of suppliers in the lifecycle.

One of the proactive strategies an organization can employ to improve performance toward its sustainability goals is engaging key suppliers earlier in the design process. The positive impact of supplier engagement in the design phase on financial performance has been discussed extensively in the new product development literature (Petersen et al., 2005; Primo and Amundson, 2002; Ragatz et al., 1997) and sustainability specifically (Walton et al., 1998; Zhang et al., 1997), as suppliers often have the detailed product and/or process knowledge that is a critical resource for a successful implementation phase. In fact, focused concepts such as design for the environment (Fitzgerald et al., 2005 , 2007; Zhang et al., 1997) and design for safety (Akladios et al., 1998; Gambatese et al., 1997; Karsh, 2004) have emerged detailing the benefits of considering these specific factors earlier in the design lifecycle. While the potential benefits have been discussed, the implementation of these types of sustainability issues as a decision influence during design is many times still a primarily internal activity with low involvement from outside resources (Van Hoek, 1999) due to the difficulties in obtaining this type of data (Fitzgerald et al., 2005) and the perceived cost of incentivizing suppliers to collaborate on these issues (Min and Galle, 1997; Rao and Holt, 2005). Sustainable supply management however necessitates organizations move away from these types of behaviors and consider influences beyond those normally considered in purely operational decisions (Bai and Sarkis, 2010).

Table 1 gives an overview of these issues specific to the construction industry. As the table illustrates, the construction industry is an industry in which collaboration in the supply chain has been problematic outside of individual projects (Gadde and Dubois, 2010). This has led to fragmentation and misalignment among organizations, and has been attributed to complex relationships and a "one-off" nature in which firms move from project to project, have low collaboration, and are seen as only responsible for their specific piece of the venture (Blayse and Manley, 2004). This type of environment presents an opportunity to research issues in how the fragmented supply network in "project-based, service-enhanced" supply chains such as construction can be better managed to improve sustainable outcomes by focusing on lifecycle influences of project performance rather than price-focused demand–supply interactions (Gann and Salter, 2000; Kamann et al., 2006). Lifecycle influences tend to be undervalued and addressed in the latter stages of the project lifecycle, even as research has shown the benefits of incorporating lifecycle-based factors earlier in the procurement process through early supplier engagement (Eriksson and Westerberg, 2011; Swan and

Table 1
Key issues affecting sustainable supply management in the construction industry.

Key issue	Citations
Low collaboration between firms in the supply chain	Blayse and Manley (2004), Gadde and Dubois (2010), Kent and Becerik-Gerber (2010)
Price-focused interactions between firms	Gann and Salter (2000), Kamann et al. (2006), Zimina et al. (2012)
Key construction suppliers viewed as interchangeable commodities	Akintoye et al. (2000), Khalfan et al. (2001)
Worker safety left to implementation stage	Behm (2005), Gambatese et al. (2005), Gambatese et al. (1997), Hinze and Wiegand (1992), Huang and Hinze (2006), Lingard et al. (2014)