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Towards a process framework for sub-supplier sustainability management

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ABSTRACT

Literature increasingly argues that buying organizations are responsible for the social and environmental practices of organizations further upstream in their supply chain: sub-suppliers, determined by their organizational distance. In such settings, selecting or knowing sub-suppliers, monitoring their performance and influencing them requires different processes versus dealing with direct suppliers. This paper suggests a set of business processes; serving as the basis for future research in managing sub-suppliers.

KEYWORDS: Sub-supplier, sustainable supply chain, supplier management

INTRODUCTION

With continuing outsourcing of value creation to suppliers in many tier levels in the supply chain, an increasing number of sub-suppliers on sub-tier levels contribute important value adding steps to finished goods. This paper follows Grimm et al. (2016), defining sub-suppliers as all indirect upstream suppliers, including traders and service providers but also sub-contractors within the visible horizon (Carter et al., 2015). In essence: sub-suppliers are the suppliers' suppliers, the suppliers' suppliers' suppliers, and so forth. The determining factors for a sub-supplier are contribution of value added in the supply chain, absence of a contractual relationship of the buyer with the sub-supplier, and existence of a direct supplier as a middleman between the buyer and the sub-supplier. The literature also refers to sub-suppliers as upstream suppliers or tier 2 or tier n level suppliers.

Sub-suppliers cause various challenges to buyers' sustainability compliance as buying companies are publicly accused for social and environmental irresponsible practices in their supply chains (Hartmann & Möller, 2015). Chinese supply into the food chain has caused multiple recalls in 2007 (Roth et al., 2008). After the collapse of the Rana Plaza building near Dhaka, Bangladesh on April 24, 2013, most fashion brands and retailers were unable to ensure that none of their garments was produced in one of the affected factories, acting as sub-suppliers in their supply chain (Lund-Thomsen and Lindgreen, 2014).

The scarcity of literature on sub-supplier management (Grimm et al., 2014; Grimm et al., 2016) and the predominantly reactive practices of buying companies to problems caused by sub-suppliers once occurred suggest a limited degree of professionalization of sub-supplier management. Choi and Linton (2011) argued that relying predominantly on direct suppliers, setting the visible horizon to the first tier level, does not adequately account for the risks and opportunities on sub-tier levels.

This paper takes up the conversation arguing that supply chains are in fact supply networks (Mena et al., 2013) and depend on the performance of the various suppliers and sub-suppliers

(Yan et al., 2015). It first describes the characteristics of sub-suppliers versus suppliers and defines sub-supplier management. Based on empirical work, the paper proposes various constellations for buyer/supplier/sub-supplier-relationships, a sub-supplier management framework and sub-supplier management processes, applying the vast literature on supplier management processes to the context of sub-supplier management. Finally, it discusses implications and derives research questions.

CHARACTERISTICS OF SUB-SUPPLIERS

While both suppliers and sub-suppliers, as members of the same supply chain at different tier levels, contribute value-added to the final product or service, the key differentiating factors are the absence of a contractual relationship between the buyer and the sub-supplier as well as the existence of a direct supplier acting as a middleman between the buyer and the sub-supplier (Grimm et al., 2016). Because of this indirect relationship, sub-suppliers often find themselves outside of the buying company's visible horizon (Carter et al., 2015).

The indirect relationship between a buying company and a sub-supplier creates larger distance compared to direct supplier relationships. While buyers may have a history of collaboration with their direct suppliers, providing mutual experience with expectations, decision-making and behavior, their experience with sub-suppliers is often limited to exceptional events like supply disruptions or quality problems. Buying companies know the identity, the location and cultural background of a supplier, yet they usually know little about sub-suppliers as these are often not disclosed by suppliers. On the other hand, sub-suppliers too are little aware of the buyer and its contractual requirements to the supplier (Homburg et al., 2014). Regulation and industry practices limit the degrees of freedom in direct supplier relationships, but hardly cover buyer / supplier / sub-supplier triads.

Power and dependence matter in both buyer / supplier and buyer / sub-supplier relationships (Cox, 2001). While the assessment of power and dependence benefits from transparency about business volumes, sunk cost or specific resources (Pfeffer, & Salancik, 1978), each additional intermediary between a buyer and a sub-supplier makes it more difficult to identify the direct business impact on one another. Still, buyers can be highly dependent on distant sub-suppliers (Yan et al., 2015).

SUB-SUPPLIER MANAGEMENT

Sub-supplier management shall be understood in this paper as the organization and coordination of a buyer's activities to achieve sub-supplier fulfillment of the buyer requirements. This approach recommends buyers to first evaluate the necessity of accessing sub-suppliers and to act accordingly. Buyers might decide any possible form in between not intervening in the supply chain beyond the first tier level at all (leaving governance to the power of the market) to substituting sub-suppliers with own operations.

The literature covers a range of different practices in handling challenges caused by sub-suppliers. These practices are discussed in the context of preventing or solving specific challenges and focus on the buyer. Among the most prominent in operations and supply chain management are buyer strategies to reduce the bullwhip effect (Lee et al., 1997). Researchers deployed multi-echelon inventory models to derive strategies for demand signaling and ordering policies. (Cantor & Katok, 2012). In finance, the hedging of fluctuations of raw material price, currency exchange rate, or labor cost on sub-supplier levels receives continuous attention. Quality management looked at transferring material specifications to sub-suppliers. In supply chain management, scholars have proposed various mapping approaches for supply chains (Ferries, 2009). In sustainability research, a few papers investigate explicitly how buyers influence sub-suppliers, e.g. buyers' sub-supplier management practices to ensure sub-supplier compliance with buyers' corporate sustainability standards (Grimm et al., 2014; 2016), or buyers' capabilities to set up voluntary sustainability initiatives engaging both suppliers and sub-suppliers (Peters et al., 2011.

RESEARCH APPROACH AND CASES

This paper combines analysis of the literature with a field study to derive a grounded process framework for sub-supplier management (Homburg et al., 2014; Eisenhardt, 1989). The research process was started with a definition of the phenomena investigated and followed up by a literature review. This resulted in a first draft for a process framework. A field study was used to explore business practices and experiences. The results of the field study were compared with the draft of the process framework and the literature on the different supplier management and sub-supplier management processes to finalize the process framework presented in the paper.

BUYER / SUPPLIER / SUB-SUPPLIER RELATIONSHIP CONSTELLATIONS

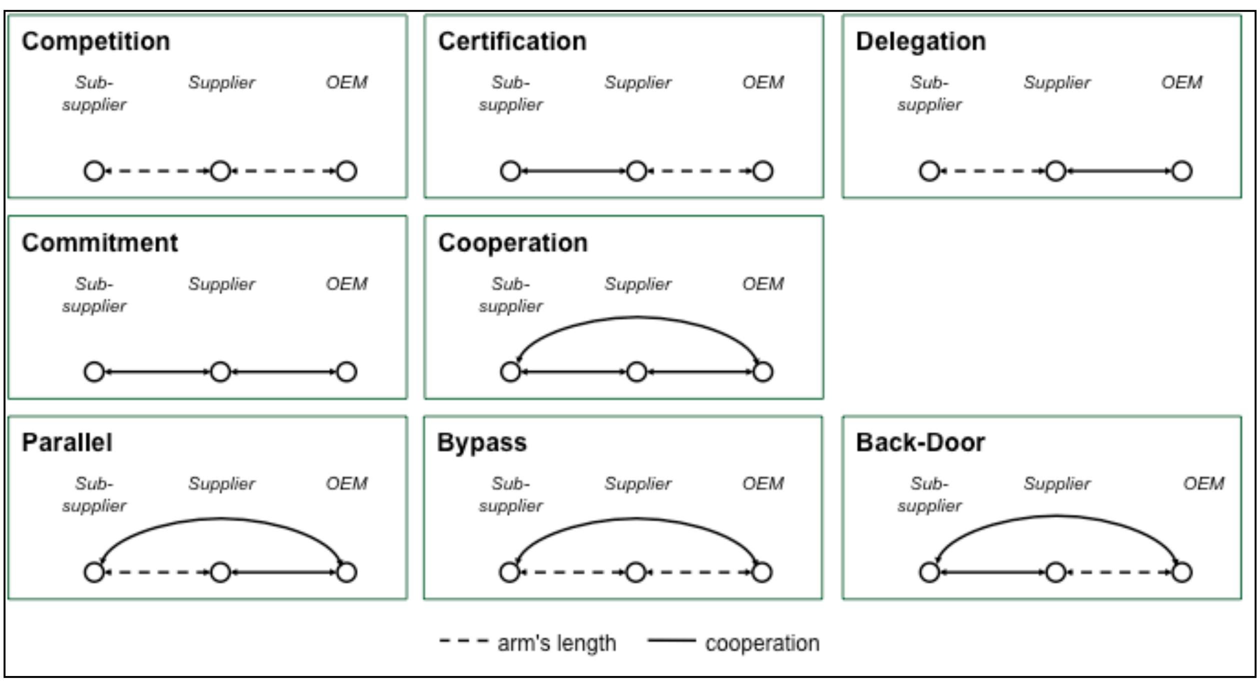

Figure 1: Buyer / supplier / sub-supplier relationship constellations

Collaboration between a buyer and a sub-supplier can take place in different relationship constellations, considering that the buyer or the sub-supplier may collaborate differently with the intermediating supplier. Thus in its most simple form of a chain consisting of the buyer, the (intermediating) supplier and this supplier's supplier, sub-supplier management needs to consider three relationships: the relationship between the buyer and the sub-supplier, the relationship between the buyer and the intermediating supplier, and the relationship between the intermediating supplier and the sub-supplier. The relationships between the buyer and the supplier or between the supplier and the sub-supplier are always direct relationships and may in their extreme form be either arm's length or cooperative, addressing the buyer requirements through open market bargaining or joint resolution (Landeros & Monczka, 1989). The relationship between the buyer and the sub-supplier may either be indirect, with no direct relationship existing at all, or direct and collaborative as there is no sense in establishing a direct relationship for open market bargaining. The eight different constellations for buyer/sub-supplier collaboration are illustrated in figure 1.

SUB-SUPPLIER MANAGEMENT FRAMEWORK

To manage sub-suppliers, buyers have four main options. Each option is associated with specific buyer/sub-supplier relationship constellations. Buyers can manage a sub-supplier (a) jointly with the intermediating supplier, (b) directly without the intermediating supplier, (c) by influencing the sub-supplier's institutional field, or (d) by delegating the full responsibility to the intermediating supplier (figure 2).

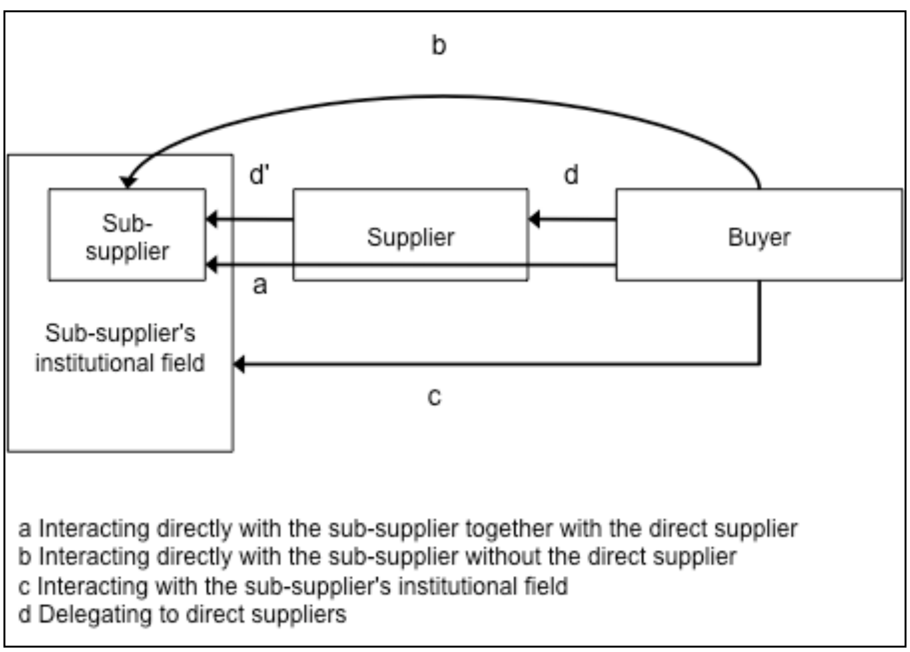

Figure 2: Sub-supplier management framework

Managing the sub-supplier directly together with the direct supplier: The buyer takes the maximum effort to actively engage both with the sub-supplier as well as with the intermediating supplier to develop and implement solutions that are best suited to all concerned members of the chain. This effort intensive approach allows creating win-win-win situations to motivate the concerned organizations to implement the solution and ensures long-term commitment to it. By ensuring the intermediating supplier invests into the sub-supplier, the buyer can safeguard own sub-supplier specific investments. With sub-suppliers delivering directly the intermediating suppliers, fit between the solutions adopted at each partner has high performance impact. Yet, the buyer has limited control over the collaboration between the supplier and the sub-supplier. This approach matches with the constellations cooperation and parallel.

Managing the sub-supplier directly without the intermediate direct supplier: The buyer takes the major effort to actively engage with the sub-supplier. Not including the intermediating supplier increases the danger that the solution developed and implemented with the sub-supplier decreases the supplier's performance or requires changes the supplier objects to implement. This approach of a buyer interacting directly with the supplier of a supplier is likely interpreted by the supplier as hostile act. The higher risk to loosing sub-supplier specific investments by excluding the intermediating supplier requires other safeguards such as the possibility to substitute the supplier without loosing the sub-supplier or a powerful sub-supplier with power over the intermediating supplier. This approach matches with the constellations bypass and back-door.

Influencing the sub-supplier's institutional field: Instead of direct interaction with the sub-supplier, the buyer actively engages in building up institutional pressures driving the sub-supplier to eventually align with the buyer's objectives. Such institutional entrepreneurship approaches (Battilana et al., 2009; Peters et al., 2011) manifest in dedicated organizations such as voluntary sustainability initiatives or in activities such as political lobbying or forming alliances with other stakeholders. That way the buyer does not invest into the sub-supplier but into long-term pressures that motivate the sub-supplier to develop and maintain a desired new practice. Thus, this approach does not match particularly with one of the constellations.

Delegating the management of the sub-supplier to intermediate direct supplier: Instead of directly interacting with the sub-supplier or its institutional field, buyers delegate the sub-supplier management to the intermediating supplier. Traditionally, active management of sub-suppliers (as described above) is treated as an exception, relying solely on market mechanisms and suppliers' own abilities to maintain a solid supply base. This approach matches with the constellations competition, hope, certification, and delegation.

In addition to these four main approaches aiming at changing the behavior of the sub-supplier, more radical approaches to improving the supply chain (from the buyer's perspective) require the buyer to extend own operations upstream into the supply chain. The most radical approach is the insourcing of activities currently performed by the respective supplier or sub-supplier. Instead of integrating the entire part of the chain, buyers may establish a fully controlled competitor to the respective sub-supplier or a fully controlled organization that acts as powerful direct supplier or customer to the sub-supplier. Following Tachizawa and Wong (2014), buyers may fully outsource sub-supplier management activities, conduct them internally, or use a mix of both. For auditing and corrective action it seems common practice that buyers require their suppliers and sub-suppliers to cover the cost by themselves (Hofstetter & Müller, 2014).

SUB-SUPPLIER MANAGEMENT PROCESSES

The literature covers a wide range of supplier management processes, yet only few sub-supplier management processes. Most supplier management processes can be extended to also cover sub-suppliers. Yet, sub-supplier management requires also particular processes. Moeller and colleagues (2006) proposed a structure for supplier management that offers a suitable application for the sub-supplier management context. They differentiate between "out-supplier management", defined as all processes with companies that are not supplying the buyer, "in-supplier management", defined as all processes with contracted suppliers, and "in-supplier dissolution management", defined as all processes with contracted suppliers to end the collaboration. Applied to sub-suppliers, the processes change or evolve as described below. (figure 3).

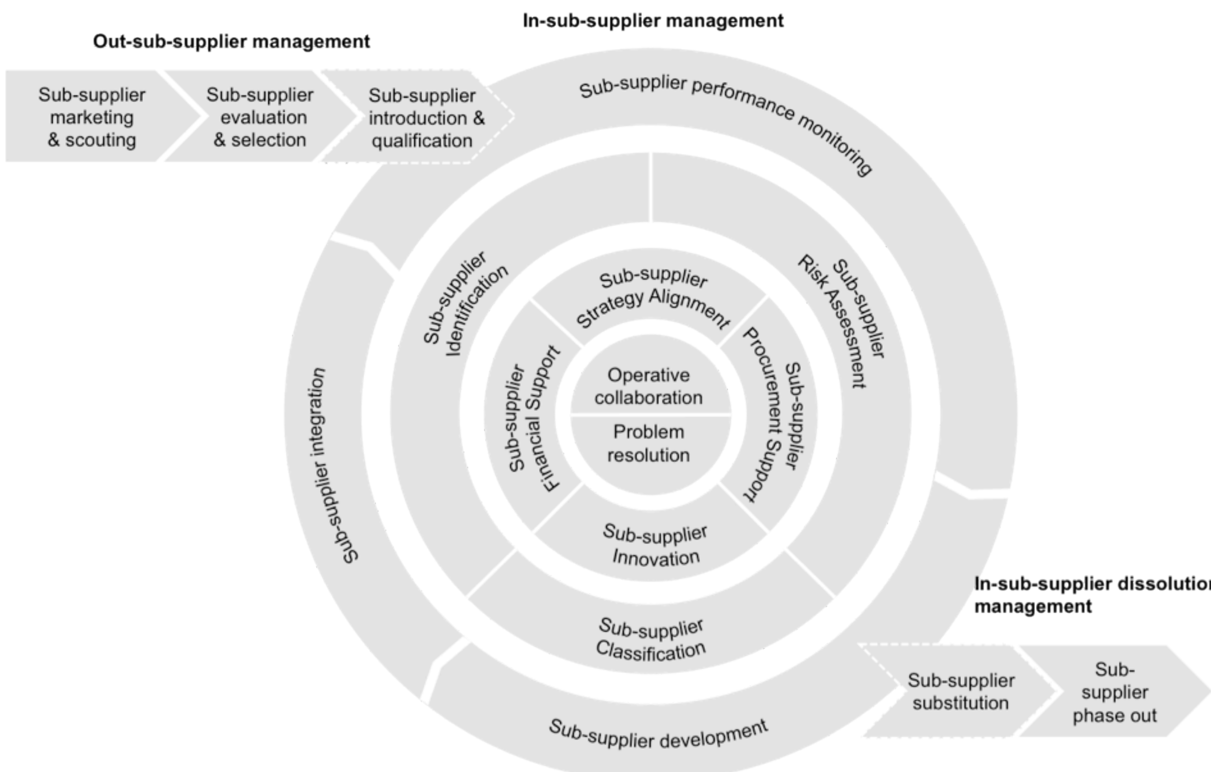

Figure 3: Sub-supplier management processes framework

<u>In-Sub-Supplier Management</u>
In-sub-supplier management refers to all processes that enable the buyer to exert control over existing sub-suppliers. In-sub-supplier management refers to five categories: Sub-supplier relationship management, internal in-sub-supplier management, sub-supplier mutual dependence management, sub-supplier operative collaboration and sub-supplier problem resolution.

<u>In-Sub-Supplier Relationship Management</u>
Sub-supplier relationship management extends the supplier management framework to sub-suppliers, including sub-supplier performance monitoring, development and integration.

Sub-Supplier Performance Monitoring is the process of specifying performance criteria and the measure, collecting performance data from the sub-supplier, comparing actual performance with performance targets, and evaluating identified deviations (Talluri & Sarkis, 2002).

Sub-Supplier Development is the process starting with addressing identified performance gaps with the sub-supplier to establishing lasting changes in sub-supplier practices that enable the sub-supplier to achieve the targeted performance (Krause et al., 2007).

Sub-Supplier Integration is the process of aligning responsibilities, structures and governance between the buyer, the sub-supplier and the intermediate supplier (Flynn et al., 2010).

Internal In-Sub-Supplier Management

Internal in-sub-supplier management processes enable the buyer to manage sub-suppliers. These processes require no interaction with the sub-supplier. They consist of sub-supplier identification, risk assessment, and classification.

Sub-Supplier Identification is the process of identifying the usual supply chains for procured material, defining what makes a supply chain path and a sub-supplier relevant, prioritizing the relevant supply chain paths, investigating the industries involved in these paths, identifying the identity of relevant sub-suppliers, and documenting these relevant sub-supplier, including master data management.

Sub-Supplier Risk Assessment is the process of gathering, analyzing and evaluating data for the identified relevant sub-suppliers and the industries they are part of on the risks they impose on the intermediate supplier, on the buyer and on the entire supply chain (Foerstl et al., 2010).

Sub-Supplier Classification is the process of structuring the large number of sub-suppliers by different criteria on sub-supplier criticality.

In-Sub-Supplier Dependence Management

In-sub-supplier dependence management refers to decisions that establish mutual dependence between the buyer and the sub-supplier, comprising of sub-supplier strategy alignment, innovation, financial support and procurement support.

Sub-Supplier Strategy Alignment is the process of mutually informing about corporate strategy elements and resulting adjustments to the strategy for one another.

Sub-Supplier Innovation refer to the processes of joint research and product development, of spotting or being informed by sub-suppliers about their innovations, and endorsing R&D.

Sub-Supplier Financial Support is the process of supporting a sub-supplier in getting access to investments or financial service at favorable cost.

Sub-Supplier Procurement Support is the process of supporting a sub-supplier in getting better access to material, services or supply conditions.

In-Sub-Supplier Operative Collaboration
In-sub-supplier operative collaboration covers the range of activities on operational level between a buyer, a sub-supplier and the intermediate supplier.

In-Sub-Supplier Problem Resolution
In-sub-supplier problem resolution refers to the processes applied to prevent, resolve, recover and learn from problems relating to availability, price (or cost), quality, counterfeits, legal compliance, environmental issues, social issues, or innovation.

Out-Sub-Supplier Management
Out-sub-supplier management refers to all processes from identifying new sub-suppliers that enable the value creation targeted by the buyer to making them ready for commercial transactions when becoming part of the buyer's supply chain.

Sub-Supplier Marketing and Scouting is the process of attracting companies that are not part of the buyer's supply chain to become part of it as in-sub-suppliers, offering their products or service to the buyer's supplier, and of searching and identifying companies that are not part of the buyer's supply chain and that have great potential to supply products or services to intermediate suppliers fulfilling the buyer's requirements better than the current ones.

Sub-Supplier Evaluation and Selection is the process of collecting reliable information about a potential sub-supplier on multiple criteria defined by the buyer and the decision on how well this company fulfills the requirements, and of prioritizing the investigated out-sub-suppliers upon the evaluation results and the decision on the out-sub-supplier(s) the buyer wants to introduce as new direct suppliers to intermediate suppliers (Chai et al., 2013).

Sub-Supplier Introduction and Qualification is the process starting from suggesting a buyer-selected out-sub-supplier as a new direct supplier to intermediate suppliers to the final decision of an intermediate supplier to contract this sub-supplier (Koh et al., 2012) and of developing the sub-supplier to adopt specified practices and structures and to reliably achieve required performance levels, potentially including qualification screenings, to fit into the operations of the intermediate supplier and buyer's supply chain (Wan et al., 2012).

In-Sub-Supplier Dissolution Management
In-sub-supplier dissolution management refers to the processes for substituting an in-sub-supplier with an alternative sub-supplier and for phasing out this sub-supplier.

Sub-Supplier Switch is the process of replacing an in-sub-supplier currently supplying to an intermediate supplier either by increasing the supply volume of other in-sub-suppliers in a multiple sourcing context or by introducing a new out-supplier (Wagner & Friedl, 2007).

Sub-Supplier Phase-Out is the process of eliminating a sub-supplier from the buyer's supply chain by ending the supply contract.

DISCUSSION AND CONCLUSIONS

Supplier management has received substantial attention in the literature. Supplier management processes have been analyzed on effectiveness and their contingencies. The rather recent extension of buyer attention beyond the direct supplier level to sub-suppliers in multi-tier supply chains calls for an evaluation of these processes in the new context. The indirect relationship between the buyer and the sub-supplier that is mediated by a supplier implies higher distance, different power structures and less degrees of freedom. The definitions and structure suggested by this paper shall provide a framework to investigate sub-supplier management in more detail while still keeping the different sub-supplier management elements in the context of a comprehensive concept.

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