Reviewing and conceptualizing supplier development

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Abstract

Purpose – The literature on supplier development (SD) is mostly fragmented, and very little research offers insights on the interrelations of the critical elements of SD. This research aims to evaluate the significance of SD and reconceptualise it by identifying and linking the key constructs and items of SD.

Design/methodology/approach – A structured literature review of SD literature was performed, and it was followed by conducting a contingency analysis of defined constructs and the items of SD. Applying a literature review and contingency analysis allows assessing the degree to which core constructs and their operational items are addressed in the SD literature.

Findings – Our findings show that a high degree of interrelations exists among enablers, relationships and supplier development strategies (SDS), of which, only indirect SDS drives the performance outcomes. However, interrelations between the individual items of the main categories of SD remain unexplored.

Research limitations/implications – The proposed revised framework reveals significant research gaps in SD and calls for a thorough examination of the topic.

Originality/value – The key contribution of the paper is reconceptualising SD and contributing to the theoretical development of SD.

Keywords Supplier development strategies (SDS), Direct and indirect SDS, Performance outcomes, Buyer–supplier relationships

Paper type Literature review

1. Introduction

Managing buyer–supplier relationships is important in dealing with uncertainty and disruption in supply chains (Friedl and Wagner, 2012; Routroy and Pradhan, 2013). One way to deal with the risk of uncertainties is to improve the capabilities of the suppliers (Yawar and Seuring, 2018). Buying firms engage in SD activities to build the capabilities of resource scarce suppliers, and in doing so improve the supply chain competitiveness and buyer-supplier performance (Jaja et al., 2016; Dalvi and Kant, 2018a, b). Supplier development (SD) is defined as “any effort of a buying firm to increase the performance and/or capabilities of the supplier and meet the buying firm’s short- and long-term supply needs” (Krause and Ellram, 1997). Direct SD requires the commitment of resources by the buying firm (Handfield et al., 2000), whereas indirect SD require nothing or only limited resources. In both cases, the aim is to build stable and long-term relationships with the suppliers, maintain a reliable supplier base and simultaneously improve the supply chain performance (Quayle, 2002; Kannan et al., 2010; Wagner, 2010; Busse et al., 2016). By now, various product and service-based industries are shown to use SD as a buying firm initiative to build a dedicated supplier base to improve their supply chain performance (Wagner, 2006a, b; Krause et al., 2007, Sancha et al., 2015; Yawar and Seuring, 2018).

In the recent years, SD has attracted considerable attention from practitioners and researchers due to its potential applications in managing supply chains. However, previous research in SD is dominated by empiricism, and therefore the conceptual and theoretical development of SD has remained abstract. Some studies (Glock et al., 2017; Noshad and
Awasthi, 2015) have conducted literature reviews to highlight the role of SD but do not present a theoretical framing or conceptual consolidation of individual elements of SD. Moreover, conceptualisation and theoretical framework requires a thorough investigation on the interrelationships and interactions between the core elements of SD. Studies such as Chidambaranathan et al. (2009), Dalvi and Kant (2015) and Chen et al. (2015, 2016) have highlighted interrelationships between core elements of SD using a literature review approach. But these studies are not based on a comprehensive review of the literature and barely conceptualise or provide theoretical framing of the key elements of SD. However, Sucky and Durst (2013) conducted a review of the empirical research on SD in detail and spotted potential gaps in their survey-based research on SD. Their conceptualisation lists multiple issues, but it does not define the constructs precisely, and the study does not discuss or test interrelationships among the individual core constructs of SD.

Based on these arguments, it can be inferred that the above-mentioned studies make valuable contributions but a rigorous discussion about the conceptual and theoretical development based on a comprehensive review of the SD literature is missing. As a result, the interrelationships and interactions between the individual categories and their items found in SD literature remain unexplained. Such efforts present only a dispersed view of SD without conceptual consolidation of the SD constructs (hitherto, referred to as categories) resulting in a limited understanding of the topic. Therefore, the objective of this article is first to review the literature systematically on SD and identify key categories. It is followed by the presentation of a conceptual consolidation of the identified SD related categories, which is an essential step towards opening the field for further discussion. Second, by performing a contingency analysis, we assess the associations between and among the key categories and the individual items of these categories and develop a conceptual comprehension of SD. Conceptual and theoretical framing allows researchers to think beyond the existing notions in the SD field and provides a deeper insight into the behavioural aspects of buyer–supplier relationships. A study of the relationships and linkages between and among individual categories and their separate items is essential for re-conceptualising and gaining an in-depth understanding of SD. It will also help the researchers and practitioners to identify and exploit the most relevant issues from the viewpoint of the successful implementation of SD programs.

The remainder of this paper is organised as follows: A brief section summarises the current conceptualisation of the field. It is taken as a starting point for subsequent analysis, while the proposed conceptual framework is partly an outcome of the present research. Therefore, it is a typical challenge in presenting findings, which are based on a combination of deductively derived and inductively refined elements, where comprehension of the SD topic emerged throughout the research. Along with the key constructs, the individual items making up these constructs are elaborated, but detailed explanations will be given later to avoid repetition. The section after that outlines the methodologies adopted for literature review and the contingency analysis. Next, descriptive analysis is presented. The findings section explains the individual items in detail and offers insights into the frequency counts of the literature review. The core contribution is based on the contingency analysis, which facilitates the reconceptualisation of the field. A discussion follows it and finally concluding remarks are presented.

2. Initial conceptual development

It is widely accepted in SD literature that both direct and indirect SD contribute towards improving performance when the focus is on the performance outcomes of the buying company (Wagner, 2010). A few elements of the typical conceptual framing of the field are summarized in the review of Sucky and Durst (2013), who offered the first set of core
constructs based on the analysis of survey-based papers. The related figure in their paper contains several open ends, while we present the relationships among the constructs more precisely in Figure 1. Further, Figure 1 proposed in this study is based on a more comprehensive review of the literature and therefore provides validity and confirms the robustness to the constructs used in the previous similar frameworks in the existing SD literature.

This framework is conceptualised based on the arguments and debates in SD literature, where several factors are listed as antecedents and barriers to SD initiatives undertaken by buying firms (Krause and Ellram, 1996; Krause, 1999; Handfield et al., 2000). The literature emphasises market competition, technological changes and strategic fit between buyers and suppliers as critical reasons for the adoption of SD initiatives (Li et al., 2007; Mahapatra et al., 2012). However, the implementation of SD initiatives is enabled by multiple factors including power asymmetries, trust levels, information sharing and communication mechanisms (Cox et al., 2004; Krause et al., 2007) among buyers and suppliers. By recognising the importance of the factors affecting SD adoption, we build the fundamental logic that specific enablers such as trust, commitment and information sharing (Carr and Kaynak, 2007; Modi and Mabert, 2007; Narasimhan et al., 2008a, b) are not only required to initiate SD efforts but also significantly influence the type of SD initiative selected. Taking this as a starting point, we identify the enablers that act as catalysts in the adoption of SDS, its impact on buyers and suppliers, and ultimately, on supply chain performance.

Supplier development efforts can be categorised into direct and indirect measures, which improve buyer–supplier relationships, thereby improving (buyer) and ultimately the supplier performance (Krause et al., 1998; Wagner, 2006a, b). Moreover, improved relations results in sustained engagement and collaboration, thus facilitating the sharing of risks and rewards among buyers and suppliers (Matook et al., 2009; Terpend and Krause, 2015). Based on these arguments in the existing literature, we include relationships as an essential construct in the present framework. Burnes and New (1996) consider suppliers as active players defining the relationship status between buyers and suppliers. Further, the composition of the supplier base and its management is a critical aspect influencing the overall improvement in the supply chain performance (Forkmann et al., 2016). Therefore, the inclusion of supplier performance becomes indispensable to study the effects of SD (Nagati and Rebolledo, 2013).
and included in Figure 1. Further, SD aims to improve supplier performance, but it ends up influencing buyer performance also in the process. Hence, we include supplier and buyer performance as the constructs in the framework.

Enablers, therefore, refer to practices or activities of firms, which act as necessary stimulants or catalysts for the firms to adopt specific strategies that are beneficial to both buyers and suppliers. These enablers may emerge owing to the routine and specialised practices of an individual firm when dealing with its suppliers. Strategies are actions resulting from the enablers, and they lead to the unique buyer–supplier relationships, enhancing performance outcomes for both parties in the process. The individual items of the framework will be explained in detail; subsequently, definitions for each item will be summarized, and key references will be listed accordingly, to put forward their current conceptualisation. Also, we will discuss the rationale of the framework again when talking about the links among the individual categories and their operational items. This deductive step, in which previous literature is considered, is combined with an inductive step of creating meaning by linking the key categories and the individual items to each other.

3. Methodology – content and contingency analysis

A literature review is a “systematic, explicit, and reproducible design for identifying, evaluating, and interpreting the existing body of recorded documents” (Fink, 2010). Further, it allows for the consolidation of the findings in the literature and highlights the gaps in the current research. Content analysis is one method for producing rigorous and sound literature reviews (Seuring and Gold, 2012; Gupta et al., 2020). Therefore, as a starting point of this study, a content analysis–based literature review of 170 peer-reviewed papers on SD by using the four-step process model developed by Mayring (2008) was carried out. Below, an explanation about the detail procedure of locating studies selection criteria, analysis and synthesis and reporting of the results is provided. For further analysis, positive associations among the core categories were extracted by performing contingency analysis, first on the main categories and then on, the individual items of the categories. Thus, insights, at both general and refined levels, about the relationships between and among the categories and their different items were obtained. The steps of both methods are explained briefly.

3.1 Material collection

The sample consisted of English-language peer-reviewed papers on SD published between the years 1988 and 2018 (30 years). A period of 30 years was selected to present a comprehensive and yet a somewhat exhaustive review of the SD literature. As a first step, keywords were identified, as recommended by Tranfield et al. (2003). The sample was collected by using the key term “supplier development” to retain the focus specifically on SD. To that end, more general terms, such as supplier management (Tranfield et al., 2003). Databases such as Scopus or web of science were not used in this study because these databases had a delayed process of updating the publications and have relatively low coverage of business, economic and management journals. Therefore, we have used other major databases and library services such as Elsevier (www.sciencedirect.com), Emerald (www.emeraldinsight.com), Springer (springerlink.com), Wiley (wiley.com), Taylor and Francis (tandfonline.com) and Ebso (ebscohost.com) for their comprehensive collection of articles on supply management in general. Hence, the most relevant and key papers on SD form the basis of this analysis. An initial search of these search engines yielded a high number of papers on SD, as indicated in Table 1. Both researchers to avoid the subjectivity bias of a single researcher (Tranfield et al., 2003) reviewed every article manually. First, papers that included “supplier development” in the title, abstract and keywords were
selected, which reduced the sample size drastically (121 papers or 4.33%). Next, both the researchers carried out a thorough reading of the entire text. The papers in which SD was the focus (such as hypothesis building or theory testing) or those in which SD had significant links to the findings and discussion part were mainly included in the review (46 papers or 1.6%). Articles, where SD was only taken up as a side argument or only one construct, was applied in a broader study on, e.g. supplier management, were not considered. For example, papers by New and Ramsay (1997), Maffin and Braiden (2001), Chen and Paulraj (2004), Mizgier et al. (2017), Talluri et al. (2010) and Yang et al. (2010), and many others were not taken into consideration for the review. These papers use a single construct within the SD literature or mention SD once or twice without providing detail information on its role in improving buyer-supplier performance. Similarly, papers such as Lauridsen (2004) and Altenburg and Meyer-Stamer (1999) which discuss the SD from developmental aspects are also excluded from the review process. Forward and backward snowball research to avoid duplication of the publications was also carried out.

Given that the unit of analysis was a single paper published in a peer-reviewed journal, conference papers, proceedings, editorials and articles in textbooks were not considered for the review. Further, papers in which SD was used as a core construct to explain sustainability issues were also excluded, as this is a relatively new area of research and differs considerably from traditional SD research. For example, external stakeholders such as consumers, NGOs, media, and labour unions enable sustainable SD practices, which is contrary to the emphasis laid on internal stakeholders such as top management in traditional SD literature. Finally, the references listed in the selected papers were scanned to ensure that no relevant articles on SD were excluded from the review. The relevance of each document and its inclusion in the review process was validated simultaneously after consultation and discussion between the authors of this research (Tranfield et al., 2003). Therefore, for the review purposes, the most representative sample wherein SD was the focus of the study was considered. This systematic process of filtering yielded 170 papers that were taken as the sample for further analysis. Table 1 summarises the details of sample selection.

### 3.2 Category selection
As is typically done in a literature review (Seuring and Gold, 2012; Gupta et al., 2020), a deductive approach followed by inductive refining of the constructs from the SD literature was applied for categorisation. Few items for direct and indirect strategies such as training, investments, supplier visits and evaluation, were derived deductively from the existing frameworks and studies on SD (Krause et al., 2000; Krause and Scannell, 2002; Wagner, 2010). Similarly, items for performance outcomes were derived deductively, whereas a process of induction was applied to obtain items for enablers and relationships categories. Therefore,
most of the derived categories build on the existing works on SD and items within the constructs are derived inductively.

3.3 Material evaluation
The publications were reviewed against the derived categories simultaneously by the authors of this paper. A frequency count of the categories was performed by assigning an article to a category in a yes or no fashion. This simplification was necessary for ensuring the feasibility of the overall assessment. For example, if the core theme of a paper was trust, leading subsequently to SD and performance outcomes, the article was coded into the trust, SD and performance outcome categories. However, the papers that mentioned trust but focussed on issues such as information sharing were coded as information sharing rather than trust. The authors carried out coding simultaneously but independently after a thorough discussion on the constructs and their definitions. Because coding was done separately, in case of disagreement, mutual consultation and extensive discussion among the authors and within the research group helped us arrive at a consensus. As suggested by Tranfield et al. (2003), a descriptive and structured content analysis was performed as a part of the material evaluation process. The descriptive study gave the authors a snapshot of the evolution of SD and a few characteristics of the sample. Furthermore, the structured content analysis yielded a summary of the findings within the literature and served as a base for the contingency analysis.

3.4 Contingency analysis
As the next step in the analysis of the collected material, a contingency analysis using SPSS v. 22.0, a commercial statistics software application was carried out. A contingency analysis detects positive associations among the pairs of categories that occur together frequently and draws a pattern of association between them (Gold et al., 2010). Contingency analysis identifies pairs of categories that occur together more often than the product of their single probabilities would suggest. This study aimed to determine the frequency of occurrences between and among the categories and their items. A ratio scale was used to determine the contingencies between the categories and a nominal scale was used to determine the contingencies among the different items of the categories. Fisher’s exact test helps avoid the statistical approximation errors associated with small sample sizes. Thus, only the values obtained in a one-sided Fisher’s exact test (p-values) are provided for the contingencies among the items. The coefficient phi ($\phi$) indicates the strength of the relationships of these pairs, where ($\phi$ values) greater than 0.3 indicate relationships between category pairs (Backhaus et al., 2008). However, a value of 0.3 is not a thumb-rule, and therefore a cut-off value of ($\phi$) can be selected based on the relative amounts of pairwise categories analysed and is further related to the subjective intentions of the researchers (Kache and Seuring, 2014). Therefore, a value of 0.25 was considered as appropriate cut off value of ($\phi$) to represent the statistical correlation between the two items or categories due to relatively smaller sample size and the limited number of categories and items that were analysed.

In this study, a ($\phi$) value of 0.25 was considered as significant for only a few pairwise categories and their items because they provide a meaningful understanding of the proposed and revised framework. It is important to note that neither a positive value of ($\phi$) indicates causality of the association between pairs of categories or items, nor does it signify that the reviewed papers tried to establish relationships between and among the constructs or their items. Therefore, the ($\phi$) value indicates only the frequency of occurrence of and the association between two constructs or items in the papers reviewed. The observed contingencies should be interpreted based on the theory used in the respective articles so that the analysis can be related to the papers in the field. In this manner, the contingency analysis performed herein supports theory-driven explanations (see, e.g. Kache and Seuring, 2014).
3.5 Validity and reliability
Construct validity is ensured because all constructs were taken from within the body of research analysed. It may appear tautological, but it is in line with the core aim of the paper, which is to assess the interrelationships between and among the constructs, as opposed to evaluating the constructs themselves. Explaining the constructs is, therefore, a necessary means of ensuring the validity and reliability of the review process. De-contextualising, the theory-led abstractions of the content analysis outcomes, allows for a certain degree of generalisation and, hence, external validity (Avenier, 2010). The two researchers coded the derived categories to achieve inter-coder reliability. When differences in coding were observed, the sample size permitted the researchers to resolve them by agreeing mutually upon a common coding. Although this process was complicated, it ensured reliability as the coding process was based on clearly defined categories and items. Furthermore, we have explained all the steps of the research process here to contribute to transparency.

4. Descriptive analysis
A descriptive analysis captures the formal aspects of a literature review. Brief descriptions of aspects such as the research methods adopted, and the theories used in SD literature are presented here. We focus only on these two issues to avoid going into excessive descriptive analysis detail in the paper. The most important and relevant findings are presented concisely to provide insights into the development of SD as a research field for over 30 years.

4.1 Research methods applied in SD research
As summarised in Table 2, this analysis provides a snapshot of the research methods used in a particular field of study. In line with previous literature reviews on other topics (e.g. Croom et al., 2000), SD literature can be classified into (a) literature reviews, (b) theoretical and conceptual research, (c) case studies, (d) surveys, (e) modelling approaches and (f) mixed methodologies.

Our findings reveal that questionnaire-based survey research constituted for half of the selected papers (87), followed by case-based studies (44) with both single and multiple cases accounting for large percentages of the selected papers, indicating high empiricism in the field of SD research. This high empiricism points to a more significant proportion of theory-testing efforts than theory-building efforts in the field, as only 19 of the papers are of a theoretical or of conceptual nature, which includes literature reviews also. Researchers can address this gap by taking up theory-building approaches to develop new conceptual models or expand existing theoretical contributions. So far, we found (17) papers that study the SD mechanisms and their impact on buyer–supplier performance outcomes using mathematical modelling and optimisation approaches. The selection criteria applied in this study might have excluded some modelling papers for this study. However, many modelling papers are published after 2007, indicating that applying such methodologies to study SD are relatively new. Three papers employed mixed methods indicating a need to include such approaches to

<table>
<thead>
<tr>
<th>Type of method applied</th>
<th>Total number of publications ($N = 170$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Survey</td>
<td>87</td>
</tr>
<tr>
<td>Case studies</td>
<td>44</td>
</tr>
<tr>
<td>Modelling</td>
<td>17</td>
</tr>
<tr>
<td>Theoretical or conceptual</td>
<td>11</td>
</tr>
<tr>
<td>Mixed methodology</td>
<td>3</td>
</tr>
<tr>
<td>Literature review</td>
<td>8</td>
</tr>
</tbody>
</table>

Table 2. Research methods applied in SD research
understand the complexities of SD. Therefore, we argue that the researchers should adopt new methodologies to get more in-depth and practical views on SD and focus more on theory building efforts.

4.2 Theoretical lenses in SD literature
The results from the sample indicate that 122 papers do not involve any specific theory, or they use general operations and supply management concepts to explain the adoption of SD by buying firms (Table 3). Applying supply management concepts is useful, but it provides only an abstract understanding of SD concepts. The results of our analysis show a dominance of transaction cost economics (TCE), resource based (RBV) and relational view as important theoretical lenses that were applied in the SD literature so far and is used in 33 papers in total. Chen et al. (2016) report similar findings from their review. RBV and TCE are used to explain the generation of trust, decreasing uncertainty, sharing knowledge and resources in the buyer-supplier transactions. Further, these theories are used to explain the risk avoidance and collaborative mechanisms that come into effect in buyer-supplier relationships during the implementation of SD initiatives. For example, the transaction cost approach explains that asset-specific investments improves the supplier retention rate resulting in the reduced risk of supply chain disruptions and enhancing the performance of the buying firms (Krause and Scannell, 2002; Humphreys et al., 2004; Li et al., 2007; Wouters et al., 2007; Mesquita et al., 2008; Wagner, 2010).

Similarly, a relational view is often used to explain the formation of collaborative and long-term relationships through generation of social capital and relational rents as a result of taking up SD strategies by the suppliers. Therefore, the use of RBV, relational view and TCE is used to explain various reasons for the adoption of SD strategies and its implications on the performance (Wagner, 2006a, b; Narasimhan et al., 2008a, b; Theodorakopoulos, 2012). Further, in four papers, the social capital theory or the social network theory has been used to explain the development of trust and commitment among buyers and suppliers, which ultimately results in SD adoption. Very few papers like Rogers et al. (2007), McKevitt and Davis (2014) and Chen et al. (2015) apply theories like knowledge chain and expectancy theory, mentoring theory and institutional theory respectively to provide insights into behavioural aspects of the firms and the adoption of SD strategies. Application of relevant theoretical lenses contribute significantly for the understanding of the SD. However, SD is a complex process that involves interactions at different levels in a supply chain and therefore might require the application of theories that are beyond operations and supply management domain. For example, theories originating from behavioural economics, social sciences and other related management fields might enrich the understanding of the SD field. As of now, there is a limited and atheoretical approach adopted by the researchers and calls for the use of theories in supply management field (Chicksand et al., 2012; Spina et al., 2016) have yielded limited results.

5. Findings of content analysis
We use the framework presented in section 2 for analysing the core constructs and evaluating them in detail. The results of the content analysis are presented in the manner below to avoid repetition, and the frequency counts are listed in Tables 4–8.

<table>
<thead>
<tr>
<th>Type of theory</th>
<th>Number of papers (N = 170)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operations and supply management concepts</td>
<td>122</td>
</tr>
<tr>
<td>Resource-based view/transaction cost economics/relational view</td>
<td>33</td>
</tr>
<tr>
<td>Social capital theory/social network theory</td>
<td>4</td>
</tr>
<tr>
<td>Others</td>
<td>11</td>
</tr>
</tbody>
</table>

Table 3: Theories in supplier development
5.1 Enablers

Extant studies have identified five significant enablers that stimulate SD activities in buying firms (see Table 4). Enablers such as trust and commitment are emphasised from the viewpoint of establishing long-term relationships (Joshi et al., 2017). Trust is a prerequisite for creating relational rents in the long term and for decreasing opportunism, which is fundamental for the buyer to initiate any SD activity (Blonska et al., 2013). Wagner (2011) argued that the gradual building of trust leads to the formation of long-term relationships and

<table>
<thead>
<tr>
<th>Items (Enablers)</th>
<th>Counts (N = 170)</th>
<th>Definition and references</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trust</td>
<td>90</td>
<td>Trust in buyer–supplier relationships is defined as the level of confidence expressed by both partners during business transactions (Prahinski and Benton, 2004; Modi and Mabert, 2007; Narasimhan et al., 2008a, b)</td>
</tr>
<tr>
<td>Commitment</td>
<td>64</td>
<td>Commitment is “the degree to which a firm feels pledged or obligated to continue business with another specific firm”. Commitment is reflected through loyalty, willingness and confidence in a long-term relationship (Anderson and Weitz, 1992; Prahinski and Benton, 2004; Ghislen, et al., 2010)</td>
</tr>
<tr>
<td>Information sharing</td>
<td>89</td>
<td>Information sharing is the sharing of practices and knowledge by buyers with suppliers and vice versa, to improve performance in a buyer–supplier relationship (Dyer and Nobeoka, 2000; Carr and Kaynak, 2007)</td>
</tr>
<tr>
<td>Communication</td>
<td>88</td>
<td>Communication is information sharing among business partners involved in a specific business transaction, usually with some systems in place (Prahinski and Benton, 2004; McGovern and Hicks, 2006)</td>
</tr>
<tr>
<td>Top management support</td>
<td>57</td>
<td>Involvement of the upper echelons of buyers and suppliers in implementing SD strategy (De Toni and Nassimbeni, 2000; Wen-li et al., 2003)</td>
</tr>
</tbody>
</table>

Table 4. Enablers of supplier development

<table>
<thead>
<tr>
<th>Items (Direct SDS)</th>
<th>Count (N = 170)</th>
<th>Definition and references</th>
</tr>
</thead>
<tbody>
<tr>
<td>Training</td>
<td>117</td>
<td>Training is defined as consisting of the buying firm’s initiatives to impart skills and transfer activities to improve the performance of suppliers (Krause, 1997; Wagner, 2010, 2011)</td>
</tr>
<tr>
<td>Education</td>
<td>62</td>
<td>Education is the activity of disseminating the buyer’s knowledge to suppliers to improve the performance of buyer–supplier relationships (Galt and Dale, 1991; Modi and Mabert, 2007)</td>
</tr>
<tr>
<td>Investments</td>
<td>120</td>
<td>SD investment refers to systematic efforts by buyer firms to improve the desired operational capabilities of suppliers through direct financial and technical assistance, and quality training to increase performance (Wagner, 2006a; Mahapatra et al., 2012)</td>
</tr>
<tr>
<td>Supplier monitoring</td>
<td>47</td>
<td>Monitoring is the continuous process of evaluating and tracking suppliers to improve their performance (Ittner et al., 1999; De Toni and Nassimbeni, 2000)</td>
</tr>
<tr>
<td>Knowledge transfer</td>
<td>75</td>
<td>Knowledge transfer involves interaction between buying and supplying firms. It can be carried out in the form of training and educational activities among buyers and suppliers (Modi and Mabert, 2007; Giannakis, 2008; Mesquita et al., 2008; Arroyo-Lopez et al., 2012; Chen et al., 2015)</td>
</tr>
</tbody>
</table>

Table 5. Direct supplier development strategies
Supplier assessment or supplier evaluation allows buying firms to evaluate supplier capabilities and compare them with those of other suppliers and provide suppliers with directions to drive improvement objectives (Krause and Scannell, 2002; Kannan and Tan, 2003; Li et al., 2007).

Supplier auditing is the process of evaluating a supplier’s capability to deliver products specified by a buyer. It is a way of finding deficiencies in supplier operations and providing feedback to improve supplier performance (Saunders, 1994; Medori and Steeple, 2000).

Supplier visits are visits by a buying firm’s personnel to a supplier site to measure the supplier’s practices against the buying firm’s specific standards (Krause and Ellram, 1997).

Supplier rewards are incentives given to suppliers to encourage and improve their performance (Monczka et al., 1993; Krause et al., 2000; Handfield et al., 2000; Krause and Scannell, 2002).

Supplier certification systems are programs that communicate the expectations of the buying firms to suppliers. They validate supplier practices against the requirements of buying firms without requiring frequent testing of the prescribed standards (Galt and Dale, 1991; Carr and Pearson, 1999; Ittner et al., 1999).

Long-term relationships are buyer–supplier relationships that emerge because of initiatives such as direct and indirect SD taken up by buying firms to improve supplier performance. These relationships do not necessarily require mutual expending of resources between buyers and suppliers (Ganesan, 1994; Spekman et al., 1998; Mahapatra et al., 2012).

Collaborations are cooperative working relationships in which mutual goals are realised through knowledge sharing, information exchange, and shared learning among buyers and suppliers. These relationships are characterised by joint negotiations and decision-making by both parties and working towards joint problem solving (Wen-li et al., 2003; Blonska et al., 2013).

Supplier performance is defined as the operational performance that is of significance for the buying firm and is expected from the supplier (mostly in terms of quality, speed, dependability, flexibility and costs (Narasimhan et al., 2008a, b)).

Buyer performance is defined as the competitive advantage gained by implementing supplier improvement programs such as SDS (Krause, 1999; Krause et al., 2007).
helps in implementing SDS. Commitment is explained as a strong enabler that acts as a precedent for creating social capital among buyers and suppliers, which then creates long-term relationships, prompting SD activities by buyers towards suppliers (Krause et al., 2007). Few studies such as Krause et al. (2007) and Ghijsen et al. (2010) de-constructed commitment in detail and studied its impact on SDS implementation. Barriciding these studies, the role of trust and commitment and its effects in the pre- and the post-SD implementation phases are missing making it unclear if trust is merely viewed as an antecedent, an outcome or a continuous process that is required to achieve buyer-supplier performance improvements. Therefore, empirical investigations into the issues of trust and commitment aside, a rigorous discussion on the effects of trust on SD activities from the perspectives of suppliers and buyers is required.

Information sharing and communication are interdependent because communication systems are needed to share information. It is argued that communication is the key to effective dissemination of information in buyer–supplier relationships (Reed and Walsh, 2002). Previous studies have indicated that information flow enhances coordination between firms and helps rectify problems at a very early stage, leading to process and product improvements (Hartley and Choi, 1996; Carr and Kaynak, 2007). Prahinski and Benton (2004) are one of the studies that have provided detail explanations about the communication strategies and their impact on supplier performance. However, despite the emphasis on information sharing and communication as potential enablers of SDS adoption, in-depth literature dealing with “what”, “how” and “which” information is to be shared and what corresponding communication strategies should be in place during different stages of buyer–supplier relationships for implementing SDS needs further empirical investigations.

Top management is considered the driving force in initiating SDS since they are responsible for resource allocation and decision-making (Krause, 1999; Adobor and McMullen, 2007; Kumar and Ruotroy, 2017). However, the role of top management is mentioned cursorily from the viewpoint of implementing SDS. Initial empirical studies on SD included top management as an essential element, but its importance in later studies on SD was overall neglected. It is somewhat surprising, given the focus on top management in supply management literature and its changing role in decision-making. Therefore, including top management as an essential variable in studying the impact of SD on buyer–supplier relationships and performance outcomes could be interesting.

The present review of SD literature yielded two broad sets of actions initiated by firms to develop their suppliers’ capabilities, namely, “Direct and Indirect SDS” (see Tables 5 and 6).

5.2 Direct supplier development (strategies)
The results show that direct SD, such as training, education and especially investments, are considered a confidence-building measure that helps establish long-term relationships and improve performance outcomes (see Table 5). Previous studies have attached significant importance to training and investments as these strategies are seen as critical to reducing the risk of opportunism in buyer–supplier relationships. It also signifies that buyers while aiming to build long-term relationship with their suppliers commit resources in the form of direct investments, which ultimately results in improving supplier performance and providing competitive advantage to buyers (De Toni and Nassimbeni, 2000; Krause et al., 2000; Wagner, 2006b; Ghijsen et al., 2010). It is interesting to note that direct SDS like supplier monitoring and knowledge transfer have received far less attention, although, these strategies are mentioned superficially throughout the SD literature (Modi and Mabert, 2007; Giannakis, 2008; Mesquita et al., 2008; Abdullah et al., 2008; Matook et al., 2009; Blonska et al., 2013; Chen et al., 2015, 2016). Given the significance of these direct SDS, future investigations could focus on critically exploring the role of monitoring and knowledge sharing mechanisms in building
the capabilities of the suppliers, overcoming uncertainty in the supply chains and its overall impact on building buyer–supplier relationships and their impact on improving performance.

5.3 Indirect supplier development (strategies)

Supplier evaluation is the single most common practice that has attracted the attention of the SD researchers consistently over the years (see Table 6). Indirect SDS, such as supplier evaluation is useful for assessing and improving supplier performance. Studies from Krause et al. (2000), Kannan and Tan (2003), Prahinski and Benton (2004) and Wagner (2006a, b) have significantly contributed to the understanding of supplier evaluation and assessment and their impact on supplier performance. For example study by Wagner (2006a, b) found significant differences between firms engaging in ad hoc and formal evaluation systems, with the latter being the preferred choice of buying firms before initiating direct SD measures. Similarly, Prahinski and Benton (2004) presents a supplier perspective on evaluation procedures and study its impact on buyer-supplier performance. For example, Rezai et al. (2015) argue that supplier evaluation is an efficient technique in segmenting the suppliers. However, it is unclear which evaluation techniques are deemed necessary in such segmentation. Therefore, future studies should clarify the distinction between formal and informal supplier evaluation and investigate their respective role in the implementation of direct SD.

The topics of supplier auditing, supplier certification and supplier visits have not received much attention in comparison to other indirect SDS topics (see Table 6). Auditing, which is a more systematic and continuous way of evaluating suppliers, and supplier certification, which helps the buyers in selecting the right suppliers to initiate SD activities, are rarely mentioned. It is argued that auditing procedures are usually carried out in buyer-supplier relationships that are highly committed to each other or when the buyers expect certain performance expectations from the suppliers. For example, Gonzalez-Benito and Dale (2001) argue that simple evaluation procedures are not enough to ensure quality improvements; instead, systematic methods of evaluation are needed to fulfil the performance expectations of the buying firms.

Similarly, Modi and Mabert (2007) argue that certification procedures are relevant precedents for the buying firms before moving towards the implementation of direct SDS such as operational knowledge transfer and training. Park et al. (1996) explore the role of certification in detail and provides insights into organisational changes resulting from the certification procedures. Based on these arguments, it can be conjectured that auditing and certification procedures determine accountability and performance guarantees, and yet these strategies did not receive the required attention. It could be partly due to lack of clarity in auditing and certification procedures in SDS programs, which is a result of the limited knowledge available on the role of auditors, and certification agencies in SD programs. Perhaps, future studies should highlight the purpose of these indirect SDS in shaping the buyer-supplier relationships and study its impact on the performance outcomes.

Incentives such as preferred supplier status, future contracts and financial incentives have been discussed, and studies such as Nagati and Rebolledo (2013) have explored the relationship between buyers’ incentives and suppliers’ response to such initiatives. More recently, Terpend and Krause (2015) in their study on incentives divided them into market-based and mutually dependent buyer-supplier incentives. They argue that cost-effectiveness is achieved in cooperative relationships, whereas quality improvements along with flexibility and innovativeness are a result of market-based competitive incentives. However, these studies do not provide enough knowledge on the incentive mechanisms and the associated variables (for example, firm size) that affect the buyer-supplier relationships and their performance. Therefore, we suggest that future studies should explore various factors leading to the adoption of indirect SDS and their impact on the buyer–supplier performance.
In general, the findings indicate that there are potential research gaps about the impact of various direct and indirect SD and their implications for buyer-supplier performance. Future studies could address the literature gaps mentioned above, explore the interactions, and provide a better understanding of these among various direct and indirect SDS.

5.4 Buyer–supplier relationships
As summarised in Table 7, long-term relationships and collaboration are mentioned frequently in the literature. It was expected because firms are increasingly looking to work with fewer suppliers and maintain closer relationships (Sarkar and Mohapatra, 2006; Sucky and Durst, 2013). Many studies, such as Blonska et al. (2013) and Wen-li et al. (2003) have concluded that collaborations are the solution for improving performance. However, the focus of their studies has rarely discussed how cooperation can be achieved through SD (Spekman, 1988). Mahapatra et al. (2012) and Blonska et al. (2013) have only discussed the impact and level of collaborations achieved via SD in detail. The effects of collaboration on performance are not mentioned; instead, the performance itself has been the focus of research.

5.5 Performance outcomes
Often researchers refer to buyer and supplier performance, with a greater emphasis on the latter. However, supplier performance as such is not at the centre of analysis in SD literature (see Table 8). The numbers presented in Table 8 is the result of an implicit assumption by the SD researchers that supplier performance is the ultimate aim of supplier development. However, the focus of their research seldom explores the impact of SD on improving performance from the supplier perspective (Joshi et al., 2017). Such a narrow view in SD literature does not capture the fundamental understanding of SD, which is based on the premise of improving supplier performance. Therefore, future studies should be more inclusive in presenting a supplier perspective on SD.

Given that each category and the underlying individual items have been presented, we can argue that the individual constructs prove to be meaningful. Accordingly, we can find some support for the given framework. Still, in evaluating this argument, we present the findings of our contingency analysis.

6. Findings of the contingency analysis
As explained in the methodology section, a contingency analysis is another means of analysing data, and it is presented in the following section. Contingency analysis allows interpreting the results of content analysis and provides insights into the interrelationships between and among the individual constructs and their respective items. We argue about the observed contingencies in two steps. First, contingencies exist among the categories (see Table 9). Second, contingencies exist among and between the items of the individual categories (see Tables 10 and 11). Based on the findings of the contingency analysis, we propose suggestions that could be used as starting points for future empirical investigations by SD researchers. Before explaining the contingencies between and among the individual items, we present the contingencies between the different categories (see Figure 2).

6.1 Contingencies between categories
There is a strong positive association between the individual categories of SD, as shown in the revised conceptual framework in Figure 2. Based on the findings of the contingency analysis, we argue that at the aggregate level, the presence of strong contingencies among enablers, strategies, relationships and performance ($\varphi = 0.370, 0.472, 0.514$ and $0.329$, respectively) largely validates the proposed initial framework in Figure 1 on SD. It also indicates that
<table>
<thead>
<tr>
<th>Correlations between main categories</th>
<th>Expected relative frequency (%)</th>
<th>Observed relative frequency (%)</th>
<th>Phi-coefficient value (ϕ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enablers and direct SD</td>
<td>79.12</td>
<td>78.82</td>
<td>0.370</td>
</tr>
<tr>
<td>Enablers and indirect SD</td>
<td>73.41</td>
<td>75.88</td>
<td>0.472</td>
</tr>
<tr>
<td>Enablers and relationships</td>
<td>68.35</td>
<td>72.94</td>
<td>0.514</td>
</tr>
<tr>
<td>Enablers and performance</td>
<td>82.18</td>
<td>83.52</td>
<td>0.329</td>
</tr>
<tr>
<td>Direct SD and indirect SD</td>
<td>81.94</td>
<td>81.76</td>
<td>0.481</td>
</tr>
<tr>
<td>Direct SD and relationships</td>
<td>76.47</td>
<td>77.06</td>
<td>0.254</td>
</tr>
<tr>
<td>Indirect SD and relationships</td>
<td>70.47</td>
<td>73.53</td>
<td>0.312</td>
</tr>
<tr>
<td>Indirect SD and performance</td>
<td>85.00</td>
<td>86.47</td>
<td>0.324</td>
</tr>
</tbody>
</table>

Table 9. Contingencies between main categories

<table>
<thead>
<tr>
<th>Correlation within categories</th>
<th>Correlation among items</th>
<th>Expected relative frequency (%)</th>
<th>Observed relative frequency (%)</th>
<th>Phi-coefficient value (ϕ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enablers and enablers</td>
<td>Trust and commitment</td>
<td>19.94</td>
<td>28.82</td>
<td>0.368</td>
</tr>
<tr>
<td></td>
<td>Trust and communication</td>
<td>27.41</td>
<td>34.11</td>
<td>0.269</td>
</tr>
<tr>
<td></td>
<td>Commitment and communication</td>
<td>19.47</td>
<td>30.00</td>
<td>0.434</td>
</tr>
<tr>
<td></td>
<td>Information sharing and communication</td>
<td>27.12</td>
<td>34.70</td>
<td>0.305</td>
</tr>
<tr>
<td>Direct and direct SDS</td>
<td>Training and Education</td>
<td>25.12</td>
<td>34.11</td>
<td>0.404</td>
</tr>
<tr>
<td>Indirect and indirect SDS</td>
<td>Supplier visits and certification</td>
<td>10.00</td>
<td>15.88</td>
<td>0.273</td>
</tr>
<tr>
<td></td>
<td>Supplier rewards and certification</td>
<td>12.41</td>
<td>20.00</td>
<td>0.343</td>
</tr>
</tbody>
</table>

Table 10. Contingencies within items of the categories

<table>
<thead>
<tr>
<th>Correlation among categories</th>
<th>Correlation among items</th>
<th>Expected relative frequency (%)</th>
<th>Observed relative frequency (%)</th>
<th>Phi-coefficient value (ϕ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enablers and indirect SDS</td>
<td>Commitment and certification</td>
<td>10.18</td>
<td>15.88</td>
<td>0.265</td>
</tr>
<tr>
<td></td>
<td>Communication and evaluation</td>
<td>33.18</td>
<td>39.41</td>
<td>0.260</td>
</tr>
<tr>
<td></td>
<td>Communication and certification</td>
<td>14.00</td>
<td>20.00</td>
<td>0.270</td>
</tr>
<tr>
<td>Enablers and relationships</td>
<td>Trust and collaboration</td>
<td>31.47</td>
<td>39.41</td>
<td>0.325</td>
</tr>
<tr>
<td></td>
<td>Commitment and long-term relationships</td>
<td>19.71</td>
<td>25.88</td>
<td>0.255</td>
</tr>
<tr>
<td></td>
<td>Communication and long-term relationships</td>
<td>27.12</td>
<td>34.11</td>
<td>0.281</td>
</tr>
<tr>
<td>Direct and indirect SDS</td>
<td>Knowledge transfer and supplier visits</td>
<td>16.35</td>
<td>22.35</td>
<td>0.250</td>
</tr>
<tr>
<td></td>
<td>Supplier rewards and investments</td>
<td>32.65</td>
<td>42.94</td>
<td>0.377</td>
</tr>
<tr>
<td>Direct SDS and relationships</td>
<td>Investments and long-term relationships</td>
<td>37.24</td>
<td>42.94</td>
<td>0.251</td>
</tr>
</tbody>
</table>

Table 11. Contingencies among items of different categories
individual or combined items of enablers have been associated with the adoption of SD strategies, relationship outcomes and their impact on the performance of buyer-supplier firms. These co-occurrences are supported by studies such as Ghijsen et al. (2010); Mahapatra et al. (2012) and Blonska et al. (2013) argue that enablers such as trust, commitment, frequent information sharing and communication as essential elements in creating relational capital ultimately resulting in establishing long-term relationships among the buyers and supplier (Carr and Kaynak, 2007; Giannakis, 2008). Similarly, studies such as (Modi and Mabert, 2007; Mesquita et al., 2008; Chen et al., 2015) has stressed the importance of enablers such as information exchange and the presence of active communication channels among buyers and suppliers acting as critical elements in enhancing the process of knowledge sharing and improving buyer-supplier performance.

Based on the results of the contingency analysis of the core constructs, we present a revised version of the conceptual framework in Figure 2 and elaborate the individual findings in the following paragraphs.

6.1.1 Enablers and SDS. The frequent co-occurrence and stronger association of enablers with direct ($\varphi = 0.370$) and indirect ($\varphi = 0.472$) SDS (see Table 9) indicates that researchers have used these categories in tandem to build arguments about various strategies initiated by the buyers to improve supplier performance. It is argued that individual or a specific set of enablers act as essential precedents in the adoption of SD initiatives (Humphreys et al., 2004; Li et al., 2007; Krause et al., 2007) resulting in an improved buyer-supplier performance (Krause, 1999; Routroy and Kumar, 2014; Dalvi and Kant, 2018a, b). Studies such as (Adobor and McMullen, 2007; Abdullah et al., 2008, Humphreys et al., 2011) argue that enablers such as trust, information sharing and top management must be in place irrespective of the type of SD activity initiated by the buying firms. These studies signify that enablers influence a firm’s choice to adopt various direct and indirect SD initiatives.

6.1.2 Enablers and relationships. A strong positive association between enablers and relationships ($\varphi = 0.514$) emphasises that enablers play a significant role in building collaborative and cooperative buyer-supplier relationships. For example, studies by Ganesan (1994) and Krause et al. (2007) and Joshi et al. (2017) found that trust and commitment (Ghijsen et al., 2010) play foundational roles in the orientation of long-term relationships among buyers.
and suppliers. Similarly, Narasimhan et al. (2008a, b) and Blonska et al. (2013) found that long-term and collaborative relationships resulting from relational capital due to SD activities help in creating trust and commitment between buyers and suppliers. Nagati and Rebolledo (2013) in their study found that nurturing long-term relationships under trust results in the exchange of high level of information exchange between buyers and suppliers. Therefore, arguments in the previous literature on SD support the positive association between enablers and relationships.

6.1.3 Enablers and performance outcomes. The findings show a positive association between enablers and performance outcomes (\( \varphi = 0.329 \)) in buyer–supplier relationships. For example, Carr and Kaynak (2007) highlight the trade-offs between advanced and traditional communication technologies and the level of information that is shared within and across the firms. They emphasise that with the emergence of advanced forms of communication technologies, the flow of information across the supply chains might improve paving the way for improved quality and financial performance. Further, Wen-li et al. (2003) found that top management commitment is vital in resource allocation and initiating SD activities. Based on these arguments in the previous SD literature, we argue that enablers are crucial determinants of SDS strategies and therefore, guide the relationship outcomes and affects the buyer–supplier performance.

6.1.4 Direct and indirect SDS. The strong co-occurrences between direct and indirect SDS (\( \varphi = 0.481 \)) indicate that these strategies are rarely discussed in isolation when talking about the implementation of SDS. Previous research has argued that the adoption of direct and indirect SDS individually or in combination depends on various factors such as the strength and intensity of transactions between buyers and suppliers. Wagner (2006a, b, 2010, 2011) and Krause et al. (2000) explore the best possible combinations of direct and indirect SDS and its impact on the buyer-supplier performance at various stages of the product lifecycle. Based on the studies, it can be interpreted that firms might initially adopt subtle SD practices such as supplier evaluation, visits and certification and eventually move towards the adoption of direct SD practices such as training, education, investment and monitoring.

6.1.5 Indirect SDS and relationships. Our analysis shows a positive association between indirect SDS (\( \varphi = 0.312 \)) and relationships, which is contrary to the standard comprehension that direct SDS usually results in collaborative and long-term relationships. However, arguments in the literature emphasise that buying firms when implementing indirect SD might aim for the development of long-term and collaborative relationships with the suppliers depending on the number of transactions between them (Wagner, 2006a). Further, buying firms with limited resources might not directly go for the implementation of direct SDS but are willing to engage their suppliers through the visit, evaluation and certification like mechanisms. More recently, studies have shown that indirect SDS create loyalty through the formation of social capital in industries where there is no scarcity of suppliers (Yawar and Seuring, 2018). Such commitment in the long-term results in collaborative relationships between buyers and suppliers. These explanations could be purely hypothetical, and therefore, future studies should carry out in-depth empirical investigations to establish a clear link between indirect SD and its impact on the formation of long-term and collaborative relationships.

6.1.6 Direct SDS and relationships. Interestingly, a relatively weaker positive association (\( \varphi = 0.254 \)) is seen between direct SD and relationships. Studies such as Krause et al. (2007), Williams (2007), Mahapatra et al. (2012) and Blonska et al. (2013) argue that direct SD leads to collaborative approaches or vice versa. Such studies offer insights into the links between relational and social capital and long-term relationships through knowledge sharing. Another explanation to a weak association could be that researchers might have assumed collaboration and long-lasting relationship as an implicit factor when firms engage in direct SD and therefore did not pay much attention to investigate the relationship itself and instead focused on the strategy part in buyer–supplier relationships.
6.1.7 Indirect SDS and performance. The positive association between indirect SDS and performance ($\varphi = 0.324$) indicate that the focus of significant SD research has been on exploring the impact of indirect SD on buyer-supplier performance. It could be a result of the importance attached to indirect SD and the overemphasis on individual items such as supplier evaluation, visits or rewards and its distinct link to the performance that is highlighted in the empirical studies reviewed in this research. Further, measuring the effects of indirect SD on buyer-supplier performance seems to be somewhat straightforward, as it does not involve hard-core measures such as evaluating the impact of asset-specific investments or the coercive power relationships that are usually employed in studying the effects of direct SD. Some studies, such as Wagner (2010) support the importance of indirect SD as a critical element in improving the operational performance of the suppliers. Sako (1999) and Humphreys et al. (2011) while reporting the findings in the automobile and electronic industries respectively emphasise that top management frequently engages in indirect SD such as evaluation and supplier visits to improve the performance of the suppliers. Based on these findings, we argue that buying firms avoid the risks in their supply chains by applying at least the indirect SD before moving towards making significant investments in the form of technical and financial resources to improve the supplier product and process performance.

6.1.8 Direct SDS and buyer–supplier performance. There is no correlation between direct SDS and buyer–supplier performance. This observation is somewhat unusual, as it is generally perceived that direct SDS such as technical and financial investment and monitoring mechanisms improve supplier capabilities, thereby enhancing buyer–supplier performance (Talluri and Sarkis, 2002; Wagner and Krause, 2009; Wagner, 2010, 2011). Perhaps, weak correlation reinforces the arguments made in the literature that performance improvement of supplier is not solely dependent on direct SD, but is accompanied by indirect SD activities such as supplier visits and evaluation, followed by supplier auditing or even direct SD measures such as monitoring the supplier (Ittner et al., 1999; De Toni and Nassimbeni, 2000; Wagner, 2010). Therefore, in-depth studies on the impacts of adopting direct SD initiatives such as monitoring, and training are required to understand the implications of these strategies on the performance of the buyers and suppliers fully. Future studies can address this research gap and contribute to expanding our understanding of the roles of various individual SD initiatives and their best combinations from the viewpoint of improving buyer–supplier performance.

6.1.9 Relationships and performance outcomes. We found no positive association between relationships and performance outcomes. It indicates that although researchers have argued for the formation of collaborative and long-term relationships to improve performance, they have not provided sufficient empirical evidence to support that argument. It may have resulted from the overemphasis on such links and the lack of precise explanations about the mechanisms and functioning of collaborative approaches that improve buyer–supplier performance. It is worth mentioning that the literature emphasises the role of SD in improving buyer and supplier performance (Krause et al., 2007, 1999; Blonska et al., 2013) but rarely discusses, mainly, supplier performance from the relationship perspective.

Building on the arguments and findings of the contingency analysis and the justifications presented above, we argue that enablers affect SDS adoption (both direct and indirect) and in some cases help forge collaborative and long-term relationships with suppliers. It is in line with the arguments in SD literature (e.g. Krause et al., 2000; Wagner, 2006a, 2010) which confirms that some enabling factors usually precede SDS adoption that is followed by engaging in long-term relationships. However, the absence of any positive correlation between relationships and performance outcomes is surprising and beyond the standard comprehension of SD. This anomaly could be due to the strong emphasis of SD researchers on the enabling mechanisms of SD and its subsequent consequences, without focusing on the
6.2 Contingencies among items of the main categories

We present the findings of the contingency analysis between and within the individual items of the primary category of SD shown in Tables 10 and 11 and list the relationships proposed in the conceptual framework. It implies that certain items are mentioned jointly more often.

The positive association among the items in one category are not very surprising. As Table 10 shows, enablers such as trust and commitment, commitment and communication (\( \varphi = 0.368 \) and 0.434, respectively) and information sharing and communication (\( \varphi = 0.305 \)) co-occur more frequently. Interestingly, there is no significant association between top management and the remaining categories, which is somewhat unexpected especially given the emphasis on the role of top management for taking decisions on resource allocation, and guiding and initiating SD activities (Krause and Ellram, 1997; Handfield et al., 2000; Giannakis, 2008). These findings are in line with those of Blonska et al. (2013), who argued that more insights are required from the top management of companies to understand the execution of SD and its impact on performance outcomes. It might be attributed to the fact that top management commitment is argued as being relevant to just about everything in management, making it unspecific for the points being analysed in this paper.

There are contingencies among the items of direct SDS and indirect SDS, as reflected in the positive association between training and education (\( \varphi = 0.404 \)) and supplier visits and certification (\( \varphi = 0.273 \)) and supplier rewards and certification (\( \varphi = 0.343 \)). These are company’s self-perpetuating mechanisms, meaning when a company initiates one type of SD, it soon moves towards adopting other similar measures. Items such as collaborations and long-term relationships do not show any positive association, possibly because we demarcated the definition between the two items in this study. Such segregation of the terms and their coding against the papers might have led to this unexpected result. Perhaps, researchers should clearly define these terms within the context of SD or consistently use the same terminology to avoid confusion.

Furthermore, there is no positive association between buyer and supplier performance, possibly because of most studies on SD presenting either a supplier or a buyer perspective while reporting the impacts of SD on performance outcomes. Researchers have rarely taken a dyadic or even a supply chain view when linking SD initiatives to performance outcomes. Such a limited approach to SD does not provide insights into buyer–supplier interactions and their impact on performance outcomes. It is important in future studies to present the view of both buyers and suppliers as the supply chains get more complicated.

6.3 Contingencies between individual items of the main categories

Results from the contingency analysis show that there is a relatively weak positive association between the individual items of enablers such as communication with indirect SD
such as supplier evaluation ($\varphi = 0.260$) of the indirect SD category. Such a co-occurrence is not surprising because it has been argued in the existing literature that the evaluation of suppliers is usually followed by communicating the feedback to the supplier firms (Oh and Rhee, 2008).

Communication plays a vital role in ensuring the timely flow of information to improve the product and processes of the supplier firms. Similarly, the commitment of buying firms for long-term business is usually followed by supplier certification and vice versa in some cases (Lo and Yeung, 2006; Modi and Mabert, 2007). There are positive associations between certification and communication ($\varphi = 0.270$) and commitment ($\varphi = 0.265$). The co-occurrences in the literature supports the explanation that feedback provided by the buying firms on the processes and products of suppliers is crucial in improving supplier performance. For example, Krause and Scannell (2002) and Modi and Mabert (2007) argue that suppliers can avoid inspections by acting on the feedback communicated by the buying firms. However, the buying and supplier firms should also show commitment to improving the performance by striving to achieve certifications to ensure the consistency in meeting the performance expectations. Although these fragmented arguments are made in the literature, it would be of interest to investigate the link connecting supplier certifications and supplier evaluation with the level of commitment and communication between buyers and suppliers empirically.

Trust shows a positive association with collaboration ($\varphi = 0.325$). It confirms previous findings in SD literature that trust acts as a critical factor in supplier management (Prahinski and Benton, 2004; Wagner, 2011). Modi and Mabert (2007) found that the generation of trust leads to the adoption of various SD activities, resulting ultimately in the formation of collaborative relationships. The establishment of trust leads to commitment among buyers and suppliers, which helps forge collaborative relationships. Commitment from the buyer side could manifest in the form of committing resources to initiate SD activities or rewarding suppliers with long-term contracts if they oblige to performance improvement demands. However, based on the results of the contingency analysis, it would be an exaggeration to assign trust as the only factor responsible for building long-term or collaborative relationships without considering other enabling factors.

The co-occurrence of individual enabler items such as commitment and communication shows a weak positive association with long-term relationships ($\varphi = 0.255$ and 0.281) respectively reinforcing the arguments made in section 6.1 that enablers play an influential role in building a long-term relationship between buyers and suppliers (Humphreys et al., 2004). For example, previous studies argue that monitoring supplier commitment is vital for buying firms to initiate SD activities (Krause, 1999). Further, Krause et al. (2007) found that buyer commitment is essential for social capital accumulation with the critical supplier, as it will ultimately result in the performance of the buying firms. Similarly, communication is necessary to keep the information flow consistent in a buyer-supplier relationship (Krause and Ellram, 1997). Effective and constant communication between buyers and suppliers is critical to the implementation of SD efforts (Wen-li et al., 2003). Further, Modi and Mabert (2007) argue that collaborative and inter-organisational communication is an essential supporting factor in transforming the supplier capabilities towards improving its performance.

Close observation of the results reveals that on a granular level, there is no correlation between and among the different items within the categories of supplier development strategies. The only exceptions are the positive association among individual items such as knowledge transfer and supplier visits ($\varphi = 0.250$), supplier rewards and investments ($\varphi = 0.377$) and supplier investments and long-term relationships ($\varphi = 0.251$) as listed in Table 11. These positive associations are logical because any knowledge sharing exercise between buyers and suppliers is usually accompanied by supplier site visits as advocated by
many authors in the SD literature (Giannakis, 2008; Chen et al., 2015, 2016). Similarly, the appearance of supplier rewards and investments could be discussed in the light of arguments made in the existing literature. For example, supplier incentives or rewards distinguishes the best and worst performing suppliers (Nagati and Rebolledo, 2013) that could be used to determine both competitive and cooperative strategy of the buyers to improve the various key performance indicators in a buyer-supplier relationship (Terpend and Krause, 2015). Such distinction between the suppliers is the first step in identifying the potential suppliers for initiating concrete SD measures like supplier investments. The relatively weak positive association between supplier investments and long-term relationship are in line with the explanations provided in the literature that buying firms usually aim for long-term relationships when they make asset-specific investments in their suppliers (Krause et al., 2007; Lettice et al., 2010; Gosling et al., 2018). While these arguments seem likely from the discussions in the literature, there is no clear evidence showing the link between these individual items. Therefore, future investigations can explore the extent to which supplier rewards and investments, supplier visits and knowledge sharing are related and in the long influences, the initiation of direct SD activities.

The absence of any positive association between the individual items of each category suggests that on a more refined level, it is challenging to establish interrelationships among the individual items of SD constructs. It indicates that many SD studies are stand-alone and focus on one particular issue rather than explaining SD mechanisms holistically. Although SD studies focusing on individual factors are important, it is critical that future studies cover multiple factors to elucidate SD mechanisms. Very few previous studies have emphasised on the interrelatedness of the different strategies and the best possible combinations thereof adopted by firms to achieve performance outcomes. A more significant number of insights into such interrelationships can provide a better understanding of the SDS that could best serve both buyer and supplier firms. Future research should consider multiple perspectives, including the relationships of buyers and suppliers because collaboration and long-term relationships demand improvements on both sides of the supply chain.

We need to exercise caution in making further detailed arguments, because in several cases, there is only one contingency among the individual items of the categories. For example, commitment is contingent with communication (see Table 10), but within the categories, it does not show any other positive association. However, we found that there are some positive association between the categories and their items (see Table 11). Therefore, we still see value in presenting the results of contingency analysis of individual items within and between the categories because such information is more detailed compared to our initial assumptions.

7. Discussion
This paper contributes to SD literature by systematically collecting related papers and summarising arguments into a conceptual framework. By doing this, we draw meaningful inferences by analysing comprehensive literature and highlight the connections between critical elements of SD. An initial framework is used for evaluating related publications systematically by performing content analysis to identify critical topics and spot research gaps in the literature. The key findings of this research suggest that the interrelations between the individual items mentioned in the frameworks and the impacts of these interrelationships on buyer–supplier relationship performance outcomes have been somewhat neglected thus far. Furthermore, this research extends the extant research (e.g. Humphreys et al., 2004; Mahapatra et al., 2012; Blonska et al., 2013) by adding details to the comprehension of SD, interrelationships within and among the core categories of SD and their respective items and highlight its impact on relationships and performance among the buyers
and suppliers. In doing so, we propose that the categories and items offered in the conceptual framework are not mutually exclusive but are complementary to each other.

As of now, it seems that the studies on SD more often talk about multiple issues concerning SD but, only delve on a few individual issues that contribute to the understanding of the SD phenomenon. For example, SD requires direct and indirect support, regular monitoring, and equal participation of buyers and suppliers, as it is a long-term process. Therefore, it is essential to focus on the various interrelationships between the elements of SD, as this would provide a more comprehensive view of buyer–supplier relationships and ultimately provide meaningful insights into buyer-supplier performance. To accomplish this, researchers should give detail insights by conducting longitudinal studies as it allows for deducing extensive observations over an extended period and could unravel multiple aspects of SD (Rezai and Ortt, 2012). Data obtained over a shorter period might not be able to capture the complexities of SD, leading to a narrow understanding of the field.

Both direct and indirect SDS are adopted depending on the practices and resources available to the buying firms and the willingness of supplier firms to accommodate them. While these explanations are proposed already in some papers (e.g. Krause, 1999; Krause et al., 2007; Sanchez-Rodriguez, 2009; Ghijsen et al., 2010; Nagati and Rebolledo, 2013), we deepen the comprehension of it in this paper. Notably, the contingency analysis performed herein allowed us to explore the interrelationships among the core categories and their items. It guided the reframing of the initial framework. While we explain these suggestions in the light of the existing literature, we are careful not to exaggerate the linkages among the proposed constructs based on the results of the contingency analysis. Nevertheless, the findings reveal that previous literature on SD has a high potential for explaining buyer–supplier relationships and performance outcomes.

The conceptual framework proposed in this paper has important implications for buyers and suppliers. The proposed framework provides the practitioners and researchers to choose the right set of enablers that could lead to the successful implementation of SD. It informs the managers and practitioners that interrelationships between various elements of SD are essential aspects in determining the application of SD strategies. Practitioners can use this framework as a starting point to strategize their global and local operations when dealing with the implementation of SD activities. Further, managers can prioritize those factors that impact the development of supplier capabilities when aiming for SD activities in their supply chains. Similarly, researchers can focus on the gaps highlighted in this paper to develop the theory related to SD. Further, we acknowledge that there are other literature reviews on the topic of SD, but the present review is the most comprehensive based on extensive set of publications that deal with more than one SD practice and its impact on performance outcomes. Therefore, researchers can use the initial findings from this study to elaborate further on the interrelationships between different practices of SD and its impact on the buyer–supplier relationships.

8. Conclusion
This paper presents a focused review of SD literature spanning 30 years, thereby moving beyond previous reviews. It holds for the overall literature review, as well as for the particular content- and contingency analysis–based approaches employed herein. Previous studies have focused on individual items within the core constructs of SD, but they have rarely summarised or used the arguments in the literature to conceptualise and reconceptualise the field into a theoretical framework. By performing a contingency analysis of relevant studies from the literature, we developed a framework that can advance the understanding of the role of SD in buyer–supplier performance. The resulting theoretical framework can serve as a starting point for future research, either in terms of refining the previous comprehensions or...
by moving beyond the arguments presented in related publications thus far. Based on the findings from the literature review, we derive the conclusion that SD is a complex process that involves an interplay of various factors, and therefore interrelationships between one or more of these factors determines the buyer–supplier relationships and the performance outcomes.

9. Limitations of the research and future research directions

The limitations of this research are both theoretical and methodological. First, we used “supplier development” as the single search term, which limited the number of papers obtained, but doing so was necessary for making the study manageable. Closely related keywords such as supplier improvement and supplier management might have revealed additional papers and insights. The analysis was performed using constructs from within the field of study, which can simultaneously be an advantage and a disadvantage.

On the one hand, such a review can be close to tautological; on the other hand, such an analysis should provide meaningful insights within the body of literature being analysed, thus justifying how we proceeded with the research and presented it. However, such a method can be linked to methodological limitation. Coding papers quantitatively as done herein could contribute to losing the context and richness of the individual articles, yet it is required to reach a higher level of abstraction, which we aimed for in this literature review. Both issues open up directions for future research to overcome the limitations above, thus advancing the field of SD.

The existing SD literature is lacking depth in covering critical perspectives such as global sourcing, cultural issues, the total cost of ownership (Ellram and Stanley, 2008), service management, power issues (Sucky and Durst, 2013) and sustainability criteria (Yawar and Seuring, 2018). Such perspectives are becoming an essential part of global supply chains as the demand for quality products from the end customers is increasing (Karaer et al., 2020). Similarly, the rise of industry 4.0 will have a profound effect on various elements of SD mentioned in this study. For example, there is a lot of emphasis on distributed ledger technology such as blockchain that will influence the buyer-supplier relationships by improving monitoring and auditing methods. It will also have an impact on trust generation and commitment among buyers and suppliers. Therefore, the inclusion of these criteria in future SD research would enrich and broaden the understanding of SDS and determine the impacts of said perspectives from the viewpoints of managing buyer–supplier relationships and improving performance. Similarly, previous literature seems to be predominantly buyer-centric and hence presents a narrow view of the SD from a supplier viewpoint. It does not highlight the role of dominant suppliers, which significantly shape the mechanisms of buyer-supplier relationship and also impact the SD initiatives on supply chains. Therefore, future research must be inclusive in capturing an in-depth supplier perspective that would facilitate improved understanding of the SD mechanisms. While studying the dyadic relationships is necessary and provides detailed insights into SD, it is essential to expand the unit of analysis to supply chains and entities such as networks and clusters. The insights obtained from the study of buyer-supplier interactions in longer supply chains, networks and clusters will add to the development of SD theory. Finally, the associations presented in the framework can be validated via future empirical investigation.

References


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Further reading


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