

Elements, Benefits, & Issues of Supplier Development Contextualizing Multiple Industries

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ABSTRACT

The purpose of this paper is to review recent research into supplier development practices. The literature is well provided with studies on supplier development. However, there was a lack a comprehensible study that encompasses supplier development practices, elements, benefits, outcomes, barriers, and issues across industries; therefore, this study was conducted. Supplier development has become a key source of competitive advantage for the buying firms. The purpose of this article was to appraise the contemporary perceptive of supplier development contextualizing various industries. A total of 98 studies were selected and examined. The literature showed that supplier development was being practiced and investigated across several industries of developed economies and limited research had been conducted for industries of developing economies. This research effort had been placed mainly to present the research gap of supplier development contextualizing various industries.

KEYWORDS: supplier development practices; competitive advantage; buying firm; industry.

1. INTRODUCTION

Supplier development practices are important components of supply chain management, these practices play vital role for bringing improvement in buyer-supplier performance. It is becoming increasing difficult to ignore the importance of supplier development practices. Previous studies have reported several definitions of supplier development which are acknowledged in this article. Supplier development covers up creation and maintenance of appropriate supplier network systematically by a buying firm [1, p. 3]. It is described further as development of suppliers for improving quality, technicality, costing capability, and delivery with continuous improvement application [2, p. 12]. Krause and Ellram [3, p. 39] construe supplier development as; temporary or permanent supply requirements of an industrial buyer are encountered by striving to improve its supplier's performance and capability.

Talluri *et al.* [4, p. 166] illustrates range of supplier development on continuum of narrow to broad involvement such as supplier evaluation and support for designing new product. Perhaps, researchers agree to the above mentioned definitions of supplier development. These basic definitions are reported frequently. However, there are some supplementary aspects of supplier development. Supplier development is classified into two perspectives, i.e., a narrow perspective and a broader perspective [1, 5, 6].

Supplier development is evidently defined by key scholars and till to date these definitions are stated repeatedly. The broader perspective of supplier development encompasses long-term mutual benefits for the buying firm and its suppliers [1, 2, 5, 6]. Supplier development activities are to improve the deficient suppliers. The buying firm and the supplier are mutually benefited out these activities. Several definitions for supplier development have been suggested, this study will use the definition suggested by Krause and Ellram [7]. Subsequent argumentation of this study is to illustrate the overview of supplier development.

1. OVERVIEW OF SUPPLIER DEVELOPMENT

A considerable amount of literature reveals that supplier development practices are contributing to improve efficiency for supply chains [6]. Manufacturers are very well conscious of the role played by their suppliers to attain and maintain the competitive advantage [8, 9]. Pertinent literature acknowledges significance of supplier development practices. The performance of supply chain is possibly improved by complying with supplier development and resulting in competitive advantage for the buying firm [4, 5].

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Source of supply selection is acknowledged a significant area of purchasing [10]. Most studies in the field of purchasing describe an important objective of purchasing function is maintaining network for capable suppliers. It results in enhanced dependence of buying firm upon its suppliers. The indulgence of supplier development is suggested to the buying firm, in due course the buying firm can conveniently concentrate upon its core competencies [11].

Several studies discuss that a buying firm needs to make and retain relationships with competent suppliers in a way so the buying firm can compete effectively. It is done by extracting optimal value through such relationships between the buyer and supplier [12, 13]. Several firms engage themselves to facilitate their suppliers for the improvement of performance and capability through supplier development [4, 11].

Moreover, a considerable amount of research is devoted to supplier development [9]. Collaboration between buyer and supplier is an emphasized topic in literature of SCM. This collaboration generates efficient and successful supply chain. Supplier development is evolved parallel to customer development [14]. Supplier development offers several benefits to the buying firm as well as to the suppliers: improvement in supplier process; capability improvement; delivery improvement; product development improvement; and quality improvement. Ultimately, the entire industry is benefited out of supplier development collaboration [4].

2. THE BACKGROUND OF SUPPLIER DEVELOPMENT

The origin of the term supplier development is evident in previous four decades when it was defined initially in the context of purchasing [10]. The intensive utilization of supplier development by Toyota in Japan is traced back to the period of World War Two [15]. It elucidates the deep rooted supplier development practices in Toyota since 1943. Supplier development was subsisting in the form of a linkage of supplier association (*Kyoho Kai*) for the sake of productivity improvement. Toyota was able to manage quick diffusion of network-knowledge sharing process for the reason that it had an all-embracing history of supplier association, supplier network and collaboration between its suppliers. These practices of Toyota paved the initial path of supplier development activities [16].

After 1990s Western automotive industry brings forth supplier development practices to improve supply chain performance and improved performance was a result of utilization of supplier development activities [17, 18]. Golden [19] and Hines [15] described the implementation of supplier development activities by automobile industry along with some other industries. For instance, John Deere, Marks and Spencer, Motorola and Digital Equipment Corporation are names of some global firms which have utilized supplier development practices. What we know about supplier development is largely based upon empirical studies conducted in North America. The first doctoral thesis encompassing supplier development appeared in 1965 [20]. Furthermore, in 1966 an article, investigating a Canadian industrial firm's supplier development activities, was published [10].

Historically as the business environment forced the manufacturing firms to act in accordance with quality management approaches. Meanwhile supplier development emerged out as a very useful and important technique to cope up the quality issues. The researchers in the field of quality management initiated the first phase of supplier development investigation during (1989-1991). The second phase proceeded when the relationship management problems were segregated by the researchers in 1995 [21].

The extension of preliminary work on supplier development is undertaken by Daniel R. Krause in 1997. He provides the foundation for further exploration of supplier development. His studies are most significant for supplier development conceptualization, application, and outcomes to the buying firm and the supplier. These large-scale empirical studies, completely dedicated to supplier development, are conducted for various industries of US [3, 5, 7, 8, 11, 22-27].

A supplier development historical comparison of American and European researchers' interest indicates that European researchers investigated issues of quality management, supply chains, and supplier relationship. However, few studies were concerned to core supplier development practices [21]. The background of supplier development features the historical presence of supplier development. Literature elaborates supplier development origin in purchasing, quality, and relationship management. Moreover, supplier development is practiced across US, Europe, and Asia in various industries. The next section is to describe the elements of supplier development from the literature.

3. ELEMENTS OF SUPPLIER DEVELOPMENT

Supplier development concept is discussed chronologically in this section of article. Little was known about supplier development activities in mid sixties. First time in 1966, the development of new source of supply was discussed and termed as supplier development [10]. In late eighties, the concept of 'reverse marketing' was introduced. However, it persisted the need to work closely with the present suppliers and reinforced the need for creation of new suppliers [28].

Initially supplier development was characterized into three stages: first stage as development of new sources of supply; second stage as development of capacity; and third stage as to attempt for performance improvement [29].

The initial analysis of barriers to supplier development contextualizing total quality management emerged in late eighties. Poor communication between buyer and the supplier, satisfaction of the supplier with respect to the buyer, and a need for the credibility of the buyer were documented as barriers [30].

In 1990 some studies appeared to discuss supplier development practices. First conceptual model of supplier development program was presented in 1990. The model depicted a matrix for the identification of supplier development's effort concentration [1]. Effective communication and information sharing were characterized vital to improve the supplier's performance. Same activities for supplier development were illustrated in a comparison of the Japanese and US approaches of supplier development [31]. Long-term relationship, communication, and rating system were exemplified to motivate supplier performance for the benefit of JIT purchasing [32].

In early nineties, a very strong realization for supplier development apprehended the firms to protect their market share by reducing supply base and with effective communication [33]. Japanese firms because of partnership style had a competitive edge over US firms. The buying firm's partnership style contained such practices: to assist the weaker supplier; specialized investment in the supplier; and to assist its suppliers by sending consultants to improve production performance [34].

Watts and Hahn [2] amplified supplier development for the sake of competitive advantage to compete globally. They argued for a network of capable suppliers would emerge out of supplier development program. They expressed supplier development was mostly practiced by larger firms with activities: supplier evaluation practices; supplier development program; and enhancement of suppliers' capabilities. They discussed the effectiveness of supplier development program. During that period, the manufacturing firms recognized their enhanced dependence upon their suppliers as it was never before. The academic world suggested the buying firms to improve the suppliers' performance and it would create a persistent flow of supply base for the manufacturers [35].

A doctoral thesis identified several influencing factors for supplier development: top management support to the procurement function; buying firm's cross functional endeavour; effective communication; proactive approach of buying firm for supplier's performance; plus support and commitment of supplier's top management towards the buyer's needs [36]. During that period supplier development was relatively a new phenomenon in US. It was surrounding formal activities carried out to improve suppliers' performance and capabilities [37]. Hartley and Jones [38] emphasized the buying firm's long-term commitment to increase the capability of the suppliers; performance awards for recognition of the suppliers; and relationship of buyer and supplier as important components to make supplier development program successful.

The first comprehensive discussion, with analysis for supplier development elements, was materialized when Krause [11] investigated supplier development concerned to buyer and reported several activities: supplier's employee training and education; visits to supplier production plant; and investment in the supplier. He declared that these activities were dependent upon commitment of buyer [11]. Supplier development core activity for an automobile manufacturing firm was named as BP (it stands for best practice, process and performance). The buying made a team with the employees of the supplier to educate and train them for implementing BP [39].

Krause and Ellram [7] reported several activities for supplier development: feedback; evaluation; uplifting expectations for performance; along with training for the employees of the supplier; supplier award for recognition; temporary transfer of buyer's employees; and capital investment. Krause and Ellram [3] affirmed supplier evaluation as a prerequisite to advance supplier development. Activities related to supplier development for quality improvement are listed in the literature: consideration of quality for the selection of a suppliers; utilization of suppliers rating system; relying upon a small number of trustworthy suppliers; appropriate education; provision of technical assistance; support for product development; long-term contract; and creating an explicit product specification for the suppliers [40, 41].

Moreover, a study concerning avoidance of supplier development pitfalls document several activities. The buying firm performs these activities for performance improvement by offering incentives; supplier's operation assessment; injecting competition among supplier; training of suppliers; financial, capital and personnel resources; share of valuable information; and effective means to measure the performance of the suppliers [42].

Krause and Scannell [26] compared supplier development of product and service industries listing supplier development activities: (1) capitalize external market to avail performance; (2) supplier assessment with feedback; (3) use of supplier awards as incentive; (4) training, education, visit to the production plant and investment for the supplier. Another supplier development activity is technological improvement capability of the supplier. It needs a long-term focus. This activity lacks the due consideration in the supplier development literature [43]. Supplier development elements are summed up in Table 1. The proceeding discussion is to elaborate the benefits and outcome of supplier development practices.

4. BENEFITS AND OUTCOMES OF SUPPLIER DEVELOPMENT PRACTICES

Empirical investigations compiled the knowledge about the benefits and outcomes of adopting supplier developing practices. Supplier development improves performance of suppliers along with supply chain. Supplier development surely accomplishes beneficial outcomes for buyer and supplier. A number of studies confirmed several benefits out of supplier development activities. Several firms practiced supplier development after recognizing long-term and strategic advantages of supplier development [44, 45]. Supplier development program supported the suppliers to enhance the capabilities that ultimately improved the buyer performance [46].

Systematic Supplier development approaches generated the outcome such as up-gradation of just-in-time capabilities of suppliers and reduction in cycle time of suppliers [19]. “Supplier Excellence Alliance” a supplier development program improved inventory level, delivery, and quality. Several aerospace manufacturing firms implemented the supplier development program to provide best practices to their suppliers [47]. Furthermore, quality improvement and cost reduction were manifested when giants of automotive industry (General Motors, Ford, Chrysler, Nissan, Honda and Toyota) followed through supplier development programs to reinforce their suppliers [4].

Supplier development program enabled Toyota to augment lean manufacturing capabilities of suppliers in Japan and US. The program was invaluable for Toyota and very beneficial for suppliers for a long period of time [16, 50]. Eminent improvements, customer awareness of brands and increased sales, were the outcomes of a supplier development program launched by Wal-Mart [51]. The presence of supplier development is noticeable in corporate world with distillation of benefits. Supplier development programs and activities are attaining accrual consideration by the scholars, as there are twelve research publications in the years 2007 exclusively, to contemplate on supplier development [6, 24, 52-61].

TABLE 1: SUPPLIER DEVELOPMENT ELEMENTS

Element	Author
Effective two way communication	Krause and Ellram [7]
Evaluation	Krause and Ellram [7]
Certification	Krause [22]
Recognition plus reward	Krause <i>et al.</i> [8]
Supplier’s site visits by buyer	Humphreys <i>et al.</i> [48]
Training plus education	Krause <i>et al.</i> [8]
Technical support	Forker and Stannack [41]
Supplying capital and equipment	Humphreys <i>et al.</i> [48] Wagner [21]
Collaboration to improve parts and substances	Sánchez-Rodríguez <i>et al.</i> [49]
Involvement for product development	Sánchez-Rodríguez <i>et al.</i> [49]
Support for entry to new market	Wagner [21]
Procurement from alternative sources	Krause and Ellram [3]
Future business promise	Giunipero [32]

Possibly, no empirical investigation compared the level of benefits for the buyer and the supplier when supplier development is employed. However, a study initiated argument that the suppliers would obtain more benefits and advantages for the supplier development activities despite the buying firm [62]. The pertinent literature discusses the benefits as well as outcomes of supplier development. Supplier development benefits are abridged in Table 2. A buying firm has to face some barriers while implying supplier development activities. In connection to the benefits of supplier development, the subsequent discussion exposes some barriers and issues in the passage of supplier development.

5. SUPPLIER DEVELOPMENT ISSUES AND BARRIERS

Supplier development is mutually beneficial for buyer and supplier. The success of buying firm is associated to the capabilities and performance of its suppliers [63]. Numerous firms are capitalizing on supplier development to collaborate with their suppliers to bring in improvement to the capabilities of suppliers [1, 2, 5, 11, 48, 57]. Despite supplier development contains several benefits for the buyers, suppliers, and the supply chain. However, a buying firm faces several issues and barriers during the supplier development process. Forthcoming discussion takes up issues and barriers during supplier development process from the pertinent literature.

Competitiveness of a firm is composed of several elements. Supplier development is regarded as a critical factor for the buying firm’s competitive advantage to be achieved, maintained and improved. There are some obstructing factors in the process of supplier development: unproductive feedback and weak communication; self-satisfaction of the supplier; misleading objectives to improve the supplier; supplier’s analysis about the reliability of the buying firm; and wrong impression about the power of procurement. These barriers obstruct the successful implementation or process of supplier development and resulting in a slowdown to buyer-supplier performance improvement [30, 33, 67].

Handfield *et al.* [42] advanced the diagnosis for barriers to supplier development. They suggested some solutions to avoid these barriers and pitfalls. They distinguished supplier-specific and buyer-specific pitfalls. Supplier-specific barriers are deficiency of technical skill; absence of commitment; and dearth of human resource. Supplier development is obstructed due to these barriers. Lack of commitment occurs when buyers are unable to describe clear promising rewards for the suppliers. Insufficiencies of resources for engineering, equipment, information systems, employee skills and training proliferate are supplier-specific hurdle during supplier development activities. The buying firms take up supplier development practices to improve the performance along with fighting back the barriers to supplier development. The next discussion is to examine the presence of supplier development in various industries.

TABLE 2: BENEFITS OF SUPPLIER DEVELOPMENT

Benefits	Author
Cost Reduction	Sako [46] and Talluri <i>et al.</i> [4]
Productivity improvement	Sako [46]
Buyer performance improvement	Saccani and Perona [64] and Sako [46]
On time delivery	Avery [47]
Improvement in quality	Avery [47] and Talluri <i>et al.</i> [4]
Lean manufacturing capability improvement	Dyer and Hatch [50] & Dyer and Nobeoka [16]
Just-in-time capability improvement	Golden [19]
Reduction in cycle time	Golden [19]
Operations improvement	Sánchez-Rodríguez <i>et al.</i> [49]
Reduction in defective products	Krause and Ellram [3]
Collaboration between buyer and supplier	Humphreys <i>et al.</i> [48], Monczka <i>et al.</i> [35], Sánchez-Rodríguez [65]
Learning and knowledge transfer	Giannakis [66], Wagner [45]
Optimal resource utilization	Talluri <i>et al.</i> [4]
Competitive advantage	Monczka <i>et al.</i> [35]
Supplier performance	Humphreys <i>et al.</i> [48]

6. SUPPLIER DEVELOPMENT IN VARIOUS INDUSTRIES

A great deal of academic work involves understanding and suggesting solutions to the problems of automobile industry contextualizing supplier development. Automotive industry is prominent for supplier development research [3, 68]. Possibly for the reason that automotive industry is stated as ‘industry of industries’ [69]. Automotive industry is certainly pioneer for supplier development practices [37]. Predominantly supplier development prevailed in Japanese auto industry for last several decades [46]. The American automobile industry gave supplier development due consideration during 1990s [37, 42]. Acceptance for supplier development by American automotive manufacturers occurred after the influx of the Japanese automotive to US [31]. Since early 1990s all most every large automobile company in America: General Motors, Ford, Chrysler, Toyota and Honda of America had a formal supplier development programs [37].

The compliance of supplier development activities by the automobile industry may be one of valid reasons for a large and growing body of literature produced by the researchers to investigate supplier development in the industry [6, 24, 30, 31, 37, 46, 55, 60, 70-76]. Recently, Ghijsen *et al.* [9] inspected automobile industry of Germany for first-tier suppliers contextualizing supplier development. The automobile industry adopted ‘buying councils’ for the sake of cooperative buying schemes in the industry and this led to cooperative supplier development among the buyers in automotive industry [4]. Supplier involvement is affirmed as a key descriptive factor for a superior performance of Japanese new product development accomplishments [77]. In automotive industry supplier development played a vital role in achieving cost reduction and improved quality when Honda, Toyota, Nissan, Chrysler, Ford, and General Motors implemented supplier development programs. These programs brought in improvements for the entire automobile industry [4].

Numerous studies are conducted encompassing several industries to investigate the supplier development. Few studies are dedicated to a single industry with an exception of automobile industry. Krause [22] and Krause *et al.* [8] collected data from several industries: manufacturing, electronic, chemical, textile, and food. Wouters *et al.* [78] investigated supplier development and cost management in Southeast Asia comprising several industries such as construction, beer, transportation, dairy and personal care. Carr and Kaynak [53] conducted an empirical study to investigate the relationships among performance, information sharing, and communication method in relation to supplier development. Sample contained several industries: metal, insurance, healthcare, furniture, food, electronics, distribution, construction, computer, chemical, banking, aviation, automotive, aerospace, medical, mining, transportation, telecommunications, pharmaceutical, steel and aluminum. Sánchez-Rodríguez *et al.* [49]

explored Spanish manufacturing sector focusing supplier development practices. They reported several industries for the sample: electronic, telecommunication, construction, pharmaceutical, chemical, automotive, food, and textile.

Wagner [45] studied impact of supplier development upon supplier' product performance, delivery performance, and capabilities. Data was collected from various industries of Germany, Switzerland, and Austria. The study listed the industries: machinery and plant construction; high-tech; electro and electronics; chemicals and pharmaceuticals; construction; automotive; textile; food; telecommunication; as well as banking and insurance. The subsequent discussion serves to studies of supplier development with varying purposes. However, these investigations were conducted specifically for a single industry: instance health care industry [79]; electronic industry [6, 24, 40, 48, 57, 80-82]; electronic component industry [83]; aerospace industry [41, 43, 84]; telecommunication [55]; construction industry [85]; aeronautical [86]; food industry [14, 87, 88]; energy industry [89]; grocery retail sector [90].

Mostly studies investigating supplier development have been carried out on automobile industry. Other industries are as well utilized for the investigation of supplier development. Few investigations for supplier development in textile industry are available; a study dedicated to 'textile/apparel industry of US' addressed logistics problems of global suppliers in the context of supplier selection and evaluation [91]. Considering the dearth of textile industry for the investigation of supplier development, the following discussion is to look at supplier development in textile industry with available literature.

Lack of supplier development investigations prevail in textile industry. The textile industry in comparison to other industries, is short of share for the investigation of supply chain management [92]. Few studies were conducted for supplier development in textile industry [93]. Scarcity of literature is evident for investigations pertaining to supplier development in textile industry. Teng and Jaramillo [91] conducted an empirical case study in US textile/apparel industry. They presented an executable model for textile industry to evaluate and select the global suppliers efficiently and effectively. UK textile industry is studied to develop interaction capability framework for smaller suppliers; who interact with larger buyers and the application of this capability framework supports suppliers to attain positioning advantage with improved customer value offered [94].

TABLE 3: SUPPLIER DEVELOPMENT IN TEXTILE INDUSTRY

Authors	Focus	Nature of Study
Teng and Jaramillo [91]	Evaluation and selection of global suppliers for US textile industry	Empirical case studies
Johnsen and Ford [94]	Interaction capability framework development for smaller suppliers' interaction with larger buyers for UK textile industry.	Empirical case studies
Lee [95]	Exploration of investment decisions made by the suppliers due to the needs of buyer in global apparel supply chains.	Empirical-case studies
Johnsen and Ford [96]	In perspective of smaller suppliers of UK textile industry, analyzed size asymmetry buyer-supplier relationship.	Empirical-case studies
Alptekin and Alptekin [97]	Supplier selection and evaluation in textile chemical industry.	Empirical-case study
Chen [98]	The development of methodology for supplier evaluation and selection in Taiwanese textile.	Empirical-case study

Global supply chains in textile industry were investigated to explore investment decisions made by the suppliers due to the needs of their buyers. Supplier strategy development framework was proposed in the perspective of suppliers [95]. An empirical study in textile industry of UK contextualizing suppliers, suggested the importance of assessment instrument for the identification of asymmetry and symmetry between buyer supplier relationships [96]. In textile chemical industry a study investigated process of supplier selection as well as evaluation. An approach was suggested to find the best suppliers combination for the buyers considering cost, quality, and delivery time [97]. For Taiwanese textile industry a structured approach for supplier evaluation and selection was suggested [98]. Dearth of research is evident pertaining to supplier development in textile industry as shown in Table 3. So far no study has been found that was conducted exclusively to investigate core supplier development practices in textile industry. This scarcity necessitates the investigation of supplier development in textile industry.

7. DISCUSSION

The present study was designed to discuss the supplier development practices, elements, and issues contextualizing multiple industries. This section pertains to the discussion along two dimensions. Firstly, it provides an examination of the review literature on supplier development practices. Secondly, it presents the contribution of the paper in context of academic work with possible future research avenues. Supplier development is very well defined in the literature with considerable amount of studies. The utilization of supplier development practices is prevalent across several industries of developed economies for last four decades. Limited research has been done for the issues and barriers of supplier development practices; however, more research has been carried out

for supplier development practices in the context of the buying firm to attain competitive advantage. There is dearth of investigation for supplier development in perspective of supplier firm. The review of articles concerning supplier development practices predominantly investigated the automobile industry; moreover, mostly studies are conducted for the industries of developed economies. Irrefutably, supplier development studies are conducted for several industries; however, textile is identified as a neglected industry for the investigations of supplier development practices even for the developed economies. Therefore, supplier development needs to be explored and investigated for the industries of developing economies and particularly for textile industry. It is expressed as a research gap that needs to be compensated with future study of supplier development to further theoretical development.

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