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## Designing vendor evaluation systems: An empirical analysis

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### ABSTRACT

Companies today are increasing efforts to develop their vendor evaluation system (VES) to qualify and select the best suppliers, monitor their performance and foster continuous improvement. VES lies at the intersection of three disciplines: purchasing management, supply chain management, and performance management. The extant literature especially focuses on vendor rating tools from a mathematical modeling standpoint, whereas firms are mostly concerned with guidelines necessary to design and implement an effective VES. The present study develops an encompassing research framework to investigate VES by means of thirteen case studies. In particular, the paper investigates VES design in terms of strategic alignment, process configuration and execution, as well as corresponding benefits and costs, exploring how the combination of the previous elements determines company satisfaction. Three groups of VESs are identified, leading to different levels of satisfaction.

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### 1. Introduction

The impact of suppliers on firm performance can be quite relevant not only to costs but also to quality, time, innovation and sustainability (Carr and Pearson, 1999; Lambert et al., 1996; Cousins and Spekman, 2003; Caniato et al., 2012). As a consequence, performance measurement broadens its scope from within a company to the entire supply/value chain (Christopher, 1998; Hald and Ellegaard, 2011). At the same time, purchasing departments increase in importance, and their role evolves from transactional to strategic (Ellram and Carr, 1994; McIvor et al., 1997; Cavinato, 1999), including the active management of supply relationships (Monczka and Trent, 1995; Carter and Narasimhan, 1995), which has evolved from an arm's-length approach to more collaborative approaches (Lamming, 1993).

Competitiveness is increasingly anchored to the appropriate selection and management of a supply base (e.g., Choi and Hartley, 1996; Huang and Keskar, 2007). Choosing the right supplier among existing suppliers, finding a new supplier, monitoring supplier performance, and operating supplier development programs require mastery of an effective Vendor Evaluation System (VES). Although most purchasing and supply chain managers would agree that such knowledge is important, several firms still lack a formal and comprehensive VES (from qualification to vendor

rating). Moreover, the literature does not currently provide the necessary evidence to support this practice because it primarily proposes a very high number of indicators to evaluate suppliers and more generally, very complex algorithms and mathematical models (e.g., De Boer and Van der Wegen, 2003; Narasimhan and Talluri, 2006). These methods are far from managers' actual needs (Brun and Pero, 2011), whereas clear guidelines for designing and implementing VESs are lacking (Huang and Keskar, 2007).

We structure this paper as follows: an overview of the relevant literature precedes our research questions and methodology. Next, we report our main results regarding the strategic alignment of the VES, process, execution, benefits and costs. Finally, we discuss the connection between these elements and user satisfaction to provide useful contributions for scholars and managers.

### 2. Literature review

The importance of vendor qualification, selection and evaluation is well recognized in the literature (Carr and Pearson, 1999; Kannan and Tan, 2002; Spina et al., 2013), along with the negative effects that an erroneous selection may cause (Carter et al., 2010). For example, the productive stream of research related to supplier development strategies (Handfield et al., 2000; Humphreys et al., 2004; Narasimhan and Jayaram, 1998; Sako, 2004; Sanchez-Rodriguez et al., 2005) acknowledges the importance of supplier evaluation (Frey and Schlosser, 1993; Galt and Dale, 1991; Krause and Scannell, 2002; Krause et al., 1998; Watts and Hahn, 1993) as a preliminary step for supplier development. In particular, Hahn et al. (1990) distinguish between narrow and passive programs

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**Table 1**  
Selected literature review about VES.

Authors	Indicators	Methods and models <sup>a</sup>	Related topics
Dickson (1966)	23 relevant supplier indicators		
Wind and Robinson, (1968)		Evaluation function approach. Manage the trade-off between different supplier indicators	
Lehmann and O'Shaughnessy (1982)	Four sets of supplier indicators: performance, economic, integrative, adaptive	Supplier indicators depend upon the type of product purchased	<ul style="list-style-type: none"> <li>• Portfolio management</li> </ul>
Ellram (1990)	Four sets of additional supplier indicators: financial, organizational, technological, miscellaneous	Partner suppliers require a different set of indicators in addition to traditional ones	<ul style="list-style-type: none"> <li>• Supplier relationship management</li> </ul>
Weber and Current (1993)		Multi-objective approach to vendor selection	<ul style="list-style-type: none"> <li>• Trade-off management</li> </ul>
Swift (1995)	Five sets of supplier indicators: product, availability, dependability, experience, price	Supplier indicators depend upon the sourcing strategy (single vs. multiple sourcing)	<ul style="list-style-type: none"> <li>• Supplier relationship management</li> </ul>
Choi and Hartley (1996)	Eight sets of supplier indicators		<ul style="list-style-type: none"> <li>• Supplier selection</li> <li>• Portfolio management (direct vs. indirect)</li> <li>• Supplier relationship management</li> </ul>
Vokurka et al. (1996)	Review previous contributions about supplier indicators	Develop a prototype expert system application for the evaluation and selection of potential suppliers	
Verma and Pullman (1998)	Compare the perceived importance of different supplier indicators (Likert scales) to actual choices of managers (DCA experiment)		<ul style="list-style-type: none"> <li>• Perceptual/ Behavioral issues</li> </ul>
Ittner et al. (1999)	Ten indicators for supplier selection and monitoring		<ul style="list-style-type: none"> <li>• Supplier relationship management</li> </ul>
Degraeve et al. (2000)		Compare different supplier selection models in terms of TCO. Mathematical programming and multiple item models generate better results	
Masella and Rangone (2000)	Four sets of supplier indicators: manufacturing and technological performance and infrastructure	Vendor selection systems (VSSs) depend upon the time frame and on the strategic relevance of buyer–supplier relation. Authors propose an AHP framework to integrate different KPIs	<ul style="list-style-type: none"> <li>• Supplier relationship management</li> </ul>
De Boer et al. (2001)		Cluster different supplier selection methods according to four stages of the evaluation process: problem definition, criteria formulation, qualification, final selection	
Lee et al. (2001)		The supplier selection and management system (SSMS) is made of purchasing strategy, supplier management, and supplier selection system	<ul style="list-style-type: none"> <li>• Strategic alignment</li> <li>• Portfolio management</li> </ul>
Kannan and Tan (2002)	Five sets of supplier selection indicators and three sets of supplier assessment indicators. Soft, non-quantifiable criteria have a great impact on buyer performance even though normally are not measured		<ul style="list-style-type: none"> <li>• Supplier selection and evaluation</li> </ul>
Krause and Scannel (2002)		Explore the content and effect of supplier development in manufacturing and service firms	<ul style="list-style-type: none"> <li>• Supplier development</li> </ul>
Muralidharan et al. (2002)		Multi-criteria decision making model for supplier rating	<ul style="list-style-type: none"> <li>• Actors involved in the evaluation process</li> </ul>
Sarkis and Talluri (2002)		Develop a model for supplier selection and evaluation, including relevant steps, indicators (strategic, operational, tangible, and intangible), and decision-making levels	

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