EVALUATION OF SUPPLIER PERFORMANCE

- the case of Volvo Car Corporation and its module suppliers

Competitive paper

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Introduction

Purchasing and suppliers are of major strategic importance to most companies today. This is because a substantial amount of the resources used by a company are made available through its suppliers. Purchases from suppliers account for more than half of total costs for most companies and in some industries, such as electronics, telecommunications, construction, and automotive, this portion is normally substantially higher (Gadde and Håkansson 2001). Suppliers are important to buying firms not only in financial terms. To an increasing extent they provide customers with new technology. Supplier performance thus considerably impacts on the efficiency and effectiveness of the customer firm and is of vital importance.

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To make sure that the performance of vendors is adequate a multitude of supplier evaluation programs have been developed. Some of these programs deal mainly with efforts of securing that suppliers function in accordance with expectations in the short run, while others focus on the long-term development of suppliers and its connection to performance. In a survey of 350 Fortune-500 companies Krause and Ellram (1997) found that performance evaluation was deemed a vital part of supplier development programs. Even those companies that had no formalized development program regarded supplier evaluation very important. Carr and Pearson (1999) conducted a study of 739 firms in a cross industry analysis and observed that firms with a strategic approach to purchasing were more involved in supplier evaluation than other firms. It was shown also that this strategic approach had a positive impact on buyer-seller relationships and, finally, supplier evaluation systems had a positive effect on the buying firm's financial performance.

Aim and scope of the paper

Evaluation of supplier performance is thus a prerequisite for supplier development. Most studies of supplier evaluation, however, are concerned with selection of new suppliers (for an overview see for example Vokurka et al. 1996, de Boer et al. 2001). The aim of this paper is to analyze how buying firms evaluate the performance of the suppliers they use. The paper consists of three parts. We start with a brief review of the literature on supplier evaluation. We continue by presenting a case study illustrating the evaluation of the performance of a car manufacturer's suppliers. Finally, the findings and implications of the case study are discussed.

Supplier evaluation in the literature

Supplier evaluation: Occurrence and involvement

The benefits of supplier evaluation are expressed in various ways. For example, Carr and Pearson (1999:457) represent one common view when arguing that supplier evaluation "provides the buying firm with a better understanding of which suppliers are performing well

and which suppliers are not performing well". This type of information might, for example, be used "to identify suppliers that could benefit most from supplier development efforts" (Forker and Mendez 2001). Besides these expressions of 'general' benefits supplier evaluation is advocated from the perspective of the various functions of the firm. Some illustrative examples are found concerning, for example, product development (De Toni and Nassimbeni 2000a), logistics (Schmitz and Platts 2003), just-in-time manufacturing (Willis and Huston 1989, De Toni and Nassimbeni 2000b), and total quality management (Giunipero and Brewer 1993).

There are a few studies illustrating the actual occurrence of supplier evaluation. For example, Simpson et al. (2002) found that about half of the purchasing managers in a survey of 299 US firms used formal supplier evaluation systems. Purchasing Magazine, in a large survey with purchasing managers across the US, showed that 61 % of the companies used formal performance measurement systems in relation to their suppliers (Morgan 2000). Pearson and Ellram (1995) compared small and large firms in the electronics industry in a national survey with regard to the utilization of supplier evaluation programs. The study showed that large companies were more involved in formal reviews than were small firms. Of the large firms 58% made a formal review every year, or more frequently, while the corresponding figure for small companies was 33%.

Some studies have analyzed which functions in the buying company that are involved in the evaluation of supplier performance. In the study of the electronics industry it was observed that purchasing, engineering, and production/operations were the functions mostly involved in evaluation. Also R&D, general management, and finance played some role in this respect (Pearson and Ellram 1995).

This first part of the literature review indicates that supplier evaluation may benefit various departments of the buying company. Reaping these benefits requires that different departments become involved in the performance evaluations. It is quite likely that these

representatives of the buying company emphasize different dimensions of supplier performance, thus making the evaluation procedure complicated.

Performance dimensions and criteria

Traditionally, price and cost used to be the dominating dimension in the evaluation of supplier performance (see, for example, Wilson 1994). Over time a number of complementary dimensions have been proposed, but in practice the majority of supplier evaluations for long tended to be routinely viewed as consisting of just three factors: price/cost, quality, and delivery (Hirakubo and Kublin 1998). More diversified views of supplier performance have been presented by advocates of so called 'multiple criteria models', for example, Talluri and Sarkis (2002), Weber (1996), and Roodhooft and Konings (1996). Tan, Lyman and Wisner (2002) propose an evaluation model, which provides a representative view of the nature of these multi-criteria models, involving the following dimensions and aspects:

- *Product and delivery assessment*, including evaluations of quality level, on-time delivery, correct quantity, service level and price/cost of product.
- *Capacity assessment*, including evaluations of willingness to change product/services to meet changing needs, flexible capacity and communication skills/systems.
- *Information assessment*, including evaluations of willingness to share sensitive information and to participate in new product development and value analyses.

The above criteria illustrate that performance can be evaluated in several dimensions. The most common measurements including cost, delivery, and product quality, focus on the output of the supplier. When companies have long-term 'partnership' relationships with suppliers though, output criteria need to be complemented with processual criteria and structural criteria (Ellram 1990). Evaluation with regard to processual criteria addresses what the supplier does, rather than achieves, and typically includes whether employees adhere to standard operating procedures or not. Structural criteria relate to the potential performance and reflect what could be done by the supplier in consideration of the resource body available,

thereby including criteria such as employee competence and equipment capability. Processual and structural criteria for performance evaluation in general are suggested by Scott (1995) and can be traced further back to Yuchtman and Seashore (1967).

The discussion this far have focused on the evaluation of individual suppliers. There are several suggestions that the evaluation of supply performance needs to be extended beyond the individual supplier. One theme in this respect relates to what is identified as 'close' or 'deep' relationships. In these relationships customer and supplier are interdependent in a number of ways. What the supplier actually can do for the customer is strongly influenced by the customer's actions. Therefore, the relevant unit of evaluation should be the relationship rather than the supplier. Lamming et al. (1995) presents a relationship assessment model, suggesting criteria for the evaluation of the supplier, the customer, and the relationship. Also O'Toole and Donaldson (2002) advocate a relationship performance approach and particularly emphasize the relevance of using both financial and non-financial measures.

The second type of extended analysis takes a supply chain perspective. The need to incorporate the whole supply chain in the performance evaluation on the supply side is discussed by, for example, Van Hoek (1998) and Beamon (1999). A framework for performance measures in a supply chain environment is developed by Gunasekaran et al. (2001). A vast number of performance indicators (financial and non-financial) are developed on strategic, tactical, and operational levels respectively.

This second part of the literature review reveals that multiple dimensions and criteria must be used in the evaluation of supplier performance. It also illuminates that the evaluation scope should be extended beyond the individual supplier in order to grasp the full potential from performance evaluation. However, these characteristics, in combination with the involvement from different departments makes supplier performance evaluation a complex issue. To illustrate the evaluation procedure and dimensions we present a deep probing case study exploring how supplier performance is evaluated in practice.

The study

The empirical basis of the paper is a case study involving Volvo Car Corporation's assembly plant in Torslanda (Sweden) and the suppliers delivering modules to its assembly line. When the case study started in 1998, Volvo had thirteen module suppliers delivering one or a few modules each to the S80-model. When the study ended in autumn 2001, Volvo had added the V70- and XC70-models to the program and seven more module suppliers were involved. In order to deliver the modules according to just-in-time principles, each module supplier operated a small pre-assembly facility located very close to Volvo's plant (not more than ten minutes driving distance). All these facilities were dedicated to Volvo and had no other customers. While cars can not be assembled without the constituent modules, Volvo was also strongly dependent on each module supplier's performance.

The case study aimed at analyzing the module suppliers' performance. One of the primary challenges was therefore to understand what a module supplier's performance really is, and how Volvo evaluates it. In accordance with the preceding literature review, the case study focused on the dimensions and criteria used for evaluation, the scope of the evaluation and the functions and people involved. More than 200 interviews were made with people representing different departments at Volvo as well as at the module suppliers. The majority of the interviews were semi-structured and lasted for about one and a half hours. Data was also collected from company records in terms of performance follow-ups, organization charts, meeting minutes, procedures and routines, etc. Also observations and many small talks provided empirical input. The many data sources accessed throughout the case study provided a deep understanding for Volvo's evaluations of its module suppliers' performance.

Volvo's evaluations of its module suppliers

In order to control and develop its 14 module suppliers, Volvo evaluates their performance with regard to many different criteria. In the following subsections, these criteria are divided into four dimensions reflecting a module supplier's performance regarding quality, delivery, cost, and overall performance, respectively.

Quality performance

Volvo' s evaluation of the quality of the products and processes of the module suppliers is illustrated in Figure 1, focusing one of the suppliers, three sub-suppliers and the departments of Volvo that are involved.

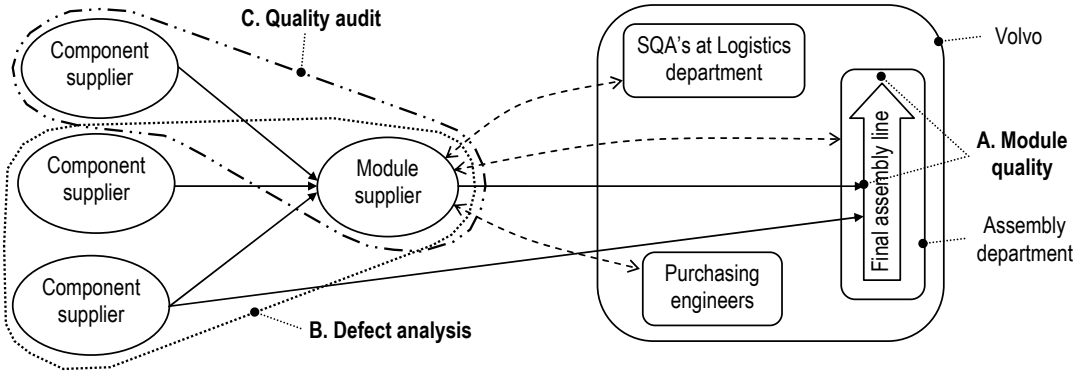

Figure 1. Volvo's evaluations of a module supplier's quality performance.

Starting with the products, each module is evaluated with regard to a number of functional, geometrical and visual quality criteria at different positions on the final assembly line as well as after it. Quality defects on a delivered module are discovered by Volvo's operators on the assembly line or by Quality Assurance engineers (QA) when the assembled cars are tested (see A in Figure 1). Feedback is given to the module supplier that takes corrective actions. Information about the defects is also given to the Supply Quality Assurance engineers (SQAs) at Volvo's Logistics department. These evaluation procedures are conducted continuously.

When a quality defect on a module is regarded as especially serious, or if it is recurrent, the responsible SQA becomes involved in the module supplier's problem analysis. Depending on the origin of the defect, the focus of the analysis differs. It may include the module supplier's internal processes and resources as well as the component suppliers (area B in Figure 1). The way the supplier handles the situation is of major importance for the evaluation. If the module supplier responds quickly and solves the problem in a structured way, the supplier might in

fact strengthen its position at Volvo. Although not all details of the supplier's disturbance handling process are formally evaluated, it forms a basis for Volvo's opinion of the supplier.

When it comes to more long-term and future oriented quality evaluations, the engineers at Volvo's Purchasing department are responsible. These evaluations are concerned with the development over time of the module quality. The primary focus of the Purchasing engineers' analyses, however, is on the suppliers' processes and resource structures. For example, the engineers analyze each supplier's adherence to quality approved working procedures and equipment capability. The module supplier's most important component suppliers are also considered in these evaluations (area C in Figure 1). These evaluations, or process quality audits, are performed each time the module is redesigned and about every second year during serial operations. A detailed checklist prescribing what to evaluate, and how to do it, is then used by the engineers. In this way, Volvo aims at supporting the module suppliers to improve their long-term quality capability and performance.

Several representatives of Volvo's Assembly, Logistics and Purchasing departments thus interact with each module supplier in the evaluation of various aspects of its product and process quality. How these different people perceive their interaction with the supplier is also a part of the evaluation. Although these 'interaction evaluations' most often are informal, they influence Volvo's general impressions of the supplier and thereby other evaluations**.** While some of the suppliers deliver more than one module, several different representatives from one and the same Volvo department are involved. These people often have different viewpoints on the supplier's performance and the interaction, adding evaluation complexity**.**

Delivery performance

The module suppliers' delivery performance is evaluated primarily in terms of delivery precision. One measure of precision addresses whether the right number of module racks is available at the supplier's loading dock when Volvo's truck arrives to pick-up the modules. While these transports occur about every hour on behalf of the Logistics department, so does

this evaluation of delivery precision. Another evaluation of delivery precision is conducted when the racks are delivered to the assembly line. Before final assembly, Volvo's operators control that the different variants of each module type are positioned in the right rack compartments through scanning a bar code. While a specific module variant is picked for each car, this aspect of delivery precision is evaluated about once a minute (i.e. Volvo's line pace).

If module variants are delivered in the wrong sequence, the Assembly operator signals the module supplier. Volvo's Delivery controllers at the Logistics department are also informed. When disturbances occur, the Delivery controllers sometimes assist the module suppliers in the analyses of the problem and suggest improvements. The problem analyses and the related evaluation of the module supplier might encompass its internal processes and resources, component suppliers, as well as the information exchange with Volvo.

A related aspect of a module supplier's delivery precision is if it makes Volvo change its production plan. This happens when a module supplier can not deliver a certain module variant for a period of time. Volvo then changes its production plan, and consequently its assembly of car variants and ordering of modules, to fit the concerned supplier's ability to deliver module variants. This is called that the supplier sets a restriction in Volvo's production plan for a period of time. While such plan changes influence Volvo's ability to keep its promised delivery times for specific car variants, all restrictions are logged and seen as a part of the module supplier's delivery performance.

Regarding long-term, future oriented, evaluations of a module supplier's delivery performance, the Delivery controllers receive support from the Logistics engineers at Volvo's Purchasing department. About every second year, logistics audits are conducted, including thorough evaluations of the module supplier's capacity and flexibility. The audits aim at identifying possible improvements and at evaluating the module supplier's ability to adapt to volume changes. Although the module supplier's component supply are considered, the audits mainly focus the supplier's internal operations (e.g. equipment capacity, working procedures, staff competence, etc).

The Assembly operators, Delivery controllers and Logistics engineers also evaluates the 'ease' of interacting with each module supplier. Occasionally such evaluations of the interaction with the supplier are made formally.

Cost performance

Volvo's cost of a module is carefully evaluated by the Purchasing department that is responsible for signing price contracts with the module suppliers. The ambition is to reduce the module price as much as possible and to ensure annual price reductions. While Volvo single-sources all modules and wants to keep the same module suppliers over a product generation (about 8 years), the module supplier's efforts to reduce the price may be as important as the price itself. When negotiating with the module supplier, the Purchaser breaks down the offered module price by analyzing the cost drivers in the module supplier's internal operations and in its component supply. The Purchaser also analyzes the component suppliers' other customer relations in order to identify opportunities for increasing economies of scale and thereby lower price. A broad scope is thus used when evaluating a module supplier from a commercial perspective (area A in Figure 2).

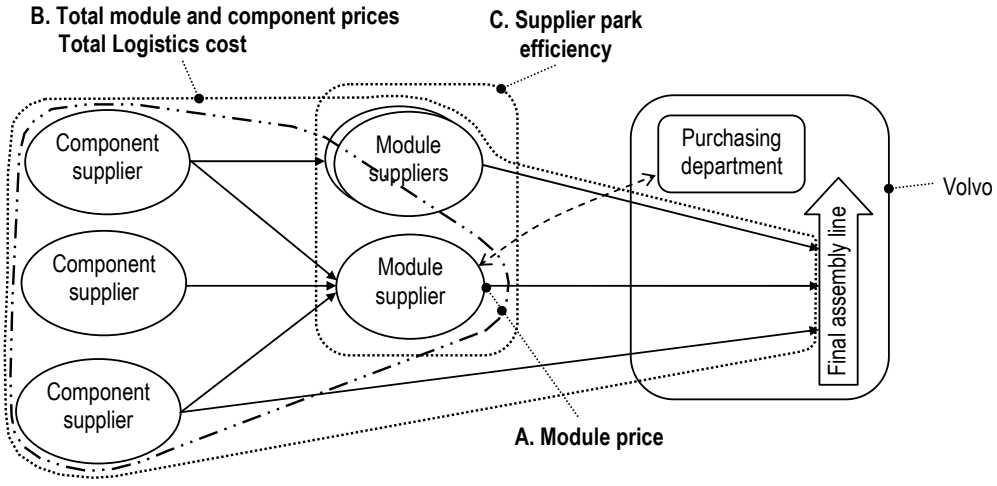

Figure 2. Volvo's evaluations of a module supplier's cost performance

An even more extensive scope is used for ensuring that the suppliers delivering components to several of Volvo's module suppliers, and to Volvo itself, consider the 'total sales' of their components that end up in Volvo-cars (see B in Figure 2). In this way, Volvo's Purchaser wants to obtain lower prices for all these components by regarding them as a 'Volvo-package'. By creating such packages through assigning module suppliers to specific component suppliers, Volvo has been able to reduce its own and the module suppliers' component prices. In other cases, the total costs of components have been lowered although a specific module supplier might pay a higher price than would have been possible by using another component supplier. In still other cases, module suppliers have established contacts between their own component suppliers and Volvo, and thereby lowered their own and Volvo's prices. A module supplier's influence on the total component and module prices is thus a vital part of its performance, and therefore a part of the commercial evaluation..

Another aspect of cost performance concerns how the module supplier fits into Volvo's supply system. This fit is a key issue for the Logistics engineers responsible for minimizing Volvo's total logistics costs. How a module supplier helps Volvo to 'optimize' the inbound transports, e.g. through adapting the module deliveries or its component supply, is seen as a part of its cost performance. The scope of these evaluations encompasses Volvo's total inbound logistics system (see B in Figure 2). Another type of fit is evaluated by the manager responsible for Volvo's two supplier parks (in Torslanda and Gent respectively). The manager's assignment is to make sure that the module suppliers in the parks operate in an efficient way from a Volvo perspective (see C in Figure 2). This may concern joint utilization of resources, e.g. that the module suppliers in the park use the same firms for temporary labor, maintenance operations, etc. Although such resource sharing may be unproductive for an individual supplier, it may benefit the supplier park as a whole. A module supplier's contributions to such solutions are seen as part of its cost performance and evaluated both formally and informally with different intervals.

When evaluating a module supplier regarding cost performance, different people from Volvo's Purchasing department reflect on how they perceive the interaction with the supplier.

Although these evaluations most often are informal, they form an important part of Volvo's evaluations of its module suppliers. This is due to the fact that the general impressions of the supplier guide other evaluations, e.g. regarding prices.

Overall performance

When selecting new suppliers and when increasing an existing supplier's responsibility, different people from Volvo's Purchasing department evaluate the module supplier's overall performance. A tool called Supplier Evaluation Model (SEM) is then used. SEM is based on the linear weighting principle and includes criteria addressing the supplier's capabilities regarding Quality, Logistics, Production, Internal management, Supply management, Environment, Engineering, Finance, etc. While SEM is an aggregate and rather rough tool, it is most often complemented by audits, primarily related to quality and logistics.

Summarizing Volvo's evaluation procedures

Volvo's evaluation of its module suppliers' performance sums up to quite a dispersed picture. Depending on the situation at hand, or the perspective taken, Volvo uses a number of different evaluation dimensions, criteria, scopes, time horizons and methods. Consequently, people with different expertise from several departments are involved in the evaluation of the module suppliers' performance in terms of output, processes and structures (see Table 1).

Table 1. Volvo's perspectives when evaluating a module supplier and its performance.

Dimensions, Criteria and scopes	Frequency (Time horizon)	Method	People involved (Department)
Module quality performance			
-Function, geometry, looks and noise module features at and after the line	1 time / minute	Formal, quant. and qual.	Assembly operators (Assembly) QA-engineers (Assembly) SQA-engineers (Logistics)
-Quality processes and structures -inside module supplier -on its supply side -in interaction with Volvo	When quality defects occur	Semi-formal, quant. and qual.	SQA-engineer (Logistics) Assembly managers (Assembly)
	1-2 times / 2 years (future oriented)	Formal	SQA-engineer (Logistics) Purchasing engineer (Purchasing)
Delivery precision performance			
-Module carrier on time at loading dock	1-2 times / hour	Formal, quant.	Delivery controller (Logistics)
-Modules in right box in carrier at line	1 time / minute	Formal, quant.	Assembly operator (Assembly)
-No. of restrictions in Volvo's plans	On occurrence	Formal, quant.	Delivery controller (Logistics)
-Logistics processes and structures -inside module supplier -on its supply side -in interaction with Volvo	When delivery deviations occur	Semi-formal, quant. and qual.	Delivery controllers (Logistics)
	1-2 times / 2 years (future oriented)	Formal, quant. and qual.	Delivery controller (Logistics) Logistics engineer (Purchasing)
Cost performance			
-Module price -Processes and structures -inside module supplier and its suppl. -in interaction with Volvo -contribution to supplier park	> 1 time / year (future oriented)	Formal, quantitative	Purchaser (Purchasing) Supplier park manager (Purchasing)
-Logistics costs -processes and structures in relation to the total logistics system	Varying, but about 1-2 times / year (future oriented)	Formal, quant. and qual.	Logistics engineer (Logistics)
Overall performance			
-Quality -Management -Delivery -Supply mgmt -Cost -Environment	> 1 time / 2-4 years (future oriented)	Semi-formal, quantitative	Purchaser (Purchasing) Purchasing engineer (Purchasing)

Table 1 shows that some of Volvo's evaluation activities addressed the module supplier's output performance, e.g. module functionality, on-time delivery and module price. Other evaluation activities captured causes to performance losses and still others aimed at estimating the supplier's capacity to perform well in the future. These latter procedures were more resource consuming and less frequently performed than the output evaluations, and focused on the module supplier's processes (such as adherence to standard operating procedures) and structural characteristics (e.g. the competence of the employees). Volvo's rationale for using various dimensions and criteria is the ambition to develop the module suppliers' capabilities. Extensive evaluations of different facets of a supplier's performance are then important.

When adding processual and structural criteria, the evaluation scope was also broadened considerably. For example, in the evaluation of the price of a module Volvo's Purchasers considered cost drivers inside the focal module supplier, and further extended the analysis to include the impact of the component suppliers, other module suppliers and also the conditions provided by Volvo itself. With this expanded evaluation scope Volvo identified constraints and improvement potentials that would not have been discovered otherwise. The explanation is that each company and plant has different types of connections to other actors and their facilities that influence its performance. For instance, Volvo's module suppliers share resources in the supplier park, some of the module suppliers also share component suppliers with each other and with Volvo. When expanding the evaluation scope beyond the focal supplier and relationship, new opportunities for performance development are revealed.

The multiple perspectives applied makes supplier evaluation a complex issue. Both qualitative and quantitative criteria had to be used by Volvo in order to reflect different characteristics of the focal supplier, as well as its component suppliers and, possibly, other related companies. People with various expertise then needs to be involved. As a consequence, evaluations of a supplier and its performance should not be seen as a single activity or process that provides a clear-cut performance grade. Supplier evaluation rather involves many activities that represent different perspectives leading to a multifaceted outcome.

Concluding discussion

Evaluation of the performance of module suppliers is an onerous task. As the study of Volvo and its suppliers shows a huge number of combinations of evaluation criteria, scopes, time horizons and methods are used simultaneously. These multiplex combinations provide different views of the supplier's performance. By varying the perspective in this way the buying company captures many different aspects of the focal supplier. Consequently, by the use of different evaluation perspectives a huge potential for performance enhancement is revealed. However, the implementation of appropriate measures to ripe these opportunities

requires fine-tuned balancing. For example, too much emphasis on the module price might hamper the development of the supplier's product and process quality. As the study shows, supplier evaluation is not concerned with a single set of homogenous activities. Instead, the evaluation of a supplier and its performance involves several activities representing various perspectives that lead to complex results and require different skills. Therefore, we need to further explore the relationship among the various combinations of evaluation procedures. In this final section we discuss the implications for the customer and the suppliers.

Implications for the customer

Various evaluation procedures provide complementary and/or overlapping perspectives on supplier performance. Complementary perspectives evaluate one and the same performance dimension by using different criteria. For example, the performance dimension delivery precision can be evaluated by using the two different criteria 'module carrier on time at loading dock' and 'number of production plan restrictions set by the supplier'. Various time horizons used for evaluating one performance dimension, e.g. module cost, are also complementary. Overlapping perspectives are at hand when one and the same criterion are used for the evaluation of different performance dimensions. One example from the study is that the characteristics of the supplier's internal processes, e.g. 'equipment capability', are used for evaluating both quality and delivery performance. Complementary and overlapping perspectives are thus characteristics of the evaluation procedures applied.

The evaluation procedures, in turn, provide outcomes concerning the performance of the supplier in the various dimensions. The results of evaluations from complementary perspectives might be contradictory. For example, a supplier performing well concerning short-term quality levels might rely on 'quick-fix'-solutions, thus neglecting long-term development and investments. In a similar way, a too heavy focus on a supplier's costs of transportation might lead to sub-optimisation of the costs in the whole logistics network. The various departments in the buying company emphasise different criteria and do their best to encourage supplier improvements in the area of their respective responsibilities. However,

the occurrence of complementarity among evaluation perspectives might lead to a situation where the ambitions of one department in the buying firm to improve performance in a particular aspect might reduce performance in other aspects of the same general dimension.

Overlapping perspectives might cause problems as well. If one and the same factor is used for the evaluation of two different performance dimensions it is not unlikely that modifications that are favourable for one dimension, causes performance losses in the other. Consequently, requirements based on one department's evaluations might erode performance for another department in the buying company.

These aspects further underline the statement that supplier evaluation is neither a single set of homogenous activities nor providing a clear-cut performance grade. Instead, evaluating a supplier and its performance involves several activities representing various perspectives that lead to complex results and require different skills and resources. Evaluations of a supplier regarding product quality typically require other skills and people than evaluations of long-term delivery performance. Although the principles for the division of labour may differ, any company with complicated functional problems need to specialize its labour and assign different tasks among them. Division of labour thus not only causes contradictory evaluation results, but is also a condition for performing complex evaluation activities at all.

Implications for suppliers

Evaluating, controlling and improving a supplier and its performance thus sums up to a complex task. Different supplier evaluation perspectives are complementary and overlapping and sometimes lead to contradictory results. As a consequence, people in the buying company representing different departments and perspectives may provide contradictory feedback. It goes without saying that these conditions make it difficult for the supplier to prioritise among alternative opportunities for performance enhancement. However, giving uniform control signals to a supplier based on a single and aggregated evaluation grade is not a suitable approach since multiple perspectives reveal a variety of performance development potentials.

Solving this dilemma requires that customer and supplier together assess the evaluation outcomes. These discussions should preferably involve representatives from the departments of customer and supplier that are concerned.

Customer-supplier interaction in this respect might solve another problem observed in studies of supplier evaluation. Purdy et al. (1994) found that suppliers are often dissatisfied with the performance evaluations conducted by their customers. More than 60 per cent of the suppliers interviewed commented that the evaluations did not accurately reflect their actual performance. The main argument was that the models assessing the effectiveness of a supplier organisation appeared to be the same model customers relied on for evaluating their own manufacturing organisation. In our study Volvo's suppliers acknowledged the need for evaluations of output, structures, and processes. On the other hand, they pointed out that their performance was to a large extent conditioned by the customer. In fact, Volvo has strongly influenced the design of all the module suppliers' processes and structures and affected the selection of component suppliers. Further, the information flows from Volvo in terms of production plans and design specification considerably impacts on the operations of suppliers. Therefore – suppliers argue – the evaluation actually captures the combined performance of Volvo and the supplier. Even buying firms express dissatisfaction with established procedures for supplier evaluation. In a recent survey more than one third of the respondents were displeased with the way evaluation schemes were used in their companies to monitor the performance of suppliers. The main criticism was related to the strong focus on 'delivery and rejected parts' (Morgan 2000), which was considered a problem for long-term development.

Evaluation in interaction

As suggested above enhanced interaction between customer and supplier concerning what corrective actions to take on the basis of the evaluations would reduce the problems related to complementary, overlapping and contradictory procedures and outcomes. Involving various departments from both sides would make it possible to better understand the multiple consequences of different improvement proposals. The benefits accompanying joint teams in

this respect have been expressed, for example, by a representative of ITT Automotives (Purchasing 1997). His argument is that "when you get a supplier, an engineer, and a purchasing person together" it is possible to jointly "review the cost parameters versus a target". Accordingly, the change process becomes better co-ordinated because "by having them work as a team all expectations are set out with respect to quality, cost, and timing" (ibid p. 32S17).

Arrangements of this type should increase the opportunities to conduct the relationship assessments suggested by Lamming et al. (1996). On the basis of this study we find it important that the activities to improve conditions on the supply side are extended from the ambition to just develop suppliers. The opportunities for a supplier to improve its performance are considerably circumscribed by the rest of the network in which it is involved. In particular, the conditions set by the customer in terms of specifications and demands for adapted solutions impacts on supplier performance. For example, Quinn (1999) argues that the buying firm should avoid too detailed direction of a supplier because this provider has been chosen for its competence and, typically has more knowledge depth than the buying firm. If the buyer specifies how to do the job in too much detail "it will kill innovation and vitiate the supplier's real advantage" (ibid. p. 19). In the same vein Araujo et al. (1999) recommend buying firms to stimulate the development of 'interactive interfaces' with suppliers. This type of customer-supplier interface enables firms to consider productivity and innovation consequences for both parties as well as the benefits that can be jointly developed with specific third parties, such as the buyer's customer and the supplier's supplier. Of particular importance in this respect is a joint view of the time dimension. As shown in the case study the time horizon applied impacts substantially on the performance evaluation. Medlin (2002) argues that managing in relationships is a 'continual balancing act between different time perspectives of past, present and future'.

The final conclusion of the study is that multiple evaluation perspectives are rewarding for enhanced supply performance. On the other hand these perspectives make life complicated both for the buying company and the supplier. Volvo's module suppliers, perceived the

contradictory and conflicting feedback difficult to handle. Still, the performance of these suppliers was evaluated by a single customer only. A much more common and complex situation occurs when suppliers have many important customers, each with its own priorities and ways of providing conflicting control signals.

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