

## VDA 6.3 BASED PROCESS AUDITS AS A TOOL FOR SUPPLIERS EVALUATION

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### ABSTRACT

*Today, in times when many manufacturing enterprises are introducing a certified quality management system, the efficiency of key processes at suppliers can be treated as a phenomenon which significantly affects the final product. Cooperation between suppliers and customers in improving of these processes significantly contributes to building partnerships in supplier-customer chain.*

*The effective communication between supplier and customer can be significantly improved by integration of process audits into the system of evaluation and selection of suppliers. The aim of this study is to propose the way of integration of process audits in the system of suppliers' evaluation and to define the benefits of this model in the context of development of partnerships with suppliers.*

### KEY WORDS

*Evaluation and selection of suppliers, process audit, partnership*

### INTRODUCTION

A corporation's global supply chain usually consists of enterprises and manufacturers that are graphically dispersed around the world, whereby each company is involved in a wide variety of supply chain activities such as order fulfilment, international procurement, acquisition of information technology, manufacturing, and customer service. Therefore, continuously tracking performance of suppliers and an appropriate selection mechanism is one of the crucial activities in supply chain management [4]. While most acknowledge the cost savings associated with more efficient buying, lower purchase costs alone are not an adequate measure of world-class procurement management. To focus solely on cost savings, we believe, falls short of excellence in sourcing and supplier management. Firms that buy "smarter" achieve lower costs and leverage supply market opportunities to accomplish corporate goals [10].

Making a decision requires the consideration of possible alternatives and then selecting the optimal one. This selection process generally relies quite considerably on subjective judgement. The intrinsic difficulty of any decision is increased by the unavailability of precise or complete information. This kind of problem exists when selecting the most appropriate supplier and it is worsened when purchasing managers are willing to adopt advanced approaches to supplier selection and auditing whereby less traditional criteria are considered [2]. It was found that the selection of supplier based on is important for the manufacturer whose focus is on product and launch flexibility [12].

### METHODOLOGY OF THE STUDY

The primary objective of the study is to propose the integration of process audits into the supplier evaluation system. Process audits of the supplier ensure not only the permanent fulfillment of the terms of contracts, but also support continuous improvement and the growth of potential of suppliers and finally can become a basis for the creation of a partnership and mutually beneficial supplier-customer relations.

The objective of the study is: based on available literature and practical experience of the authors to analyze and evaluate current trends in the evaluation and selection of suppliers. Based on the analysis of standard VDA 6.3 2010 to briefly describe a method for quantification and evaluation of processes efficiency. By means of synthesis, to propose a multicriterial scale for evaluation of suppliers based on the effectiveness of key processes at supply chain.

### AUDITS AS A METHOD OF SUPPLIERS EVALUATION

There can be no doubt, that many companies treat price as key criteria for suppliers' selection. However, modern effectively managed organizations may have many other criteria that are also very important and in some cases even more important than price. These important criteria include the overall performance of the supplier, as well as the performance of individual processes. The evaluation of these criteria is usually performed by means of audits.

The audits of the suppliers are usually implemented to assess the maturity level of quality management system. In the automotive industry the maturity of the quality management system is assessed based on the ISO / TS 16949:2009

requirements, other companies use ISO 9001:2008 standard as a system audit criteria. The objective of suppliers' audits in the evaluation phase and contracting is to assess whether the supplier is able to consistently meet the requirements of the customers. At the stage of launched trade relations audits have a different meaning, in particular auditors seek for opportunities for improvement.

In practice, we often encounter the term certified supplier. According to Bossert (2006) a certified supplier is a supplier which on the basis of sufficiently intensive examination has been recognized for quite capable to deliver products of a quality that it does not require routine examinations, on the grounds that the supplier uses processes that guarantee the ability to meet even the most demanding customer requirements [3]. According to Nenadál (2006), there are three types of certification suppliers:

- ♦ Third party certification (an independent body accredited for this type of activity). The result of this kind of certification is the grant of a certificate, for example. ISO 9001, ISO 14001, OHSAS 18001, ISO 50001, ISO / TS 16949 and below.
- ♦ Certification by the customer. In this case the customer establishes its own procedures and rules for the certification of suppliers. The aim of this kind of certification is process improvement of the supplier and so building and developing of partnerships.
- ♦ Self-certification (own employees). This type of certification is progressive manner of certification in the U.S. in particular. Most of the certification activities are performed by the supplier. Customer's activities are limited to the common discussion of self-certification conditions and improvement projects monitoring [13].

Process audits are effective and validated instrument for process improvement. Method of realization of process audits in specific organizations in most cases is provided by internal guidelines. However, there are standards and guidelines which provide describe the concrete method for auditing of processes. In the automotive industry (especially for German customers) is often used standard VDA 6.3 audit process. This standard provides guidance for implementing of the process audit and transparent evaluation, which can be easily integrated into existing or the newly built system of evaluation and selection of suppliers.

#### **VDA 6.3 BASED PROCESS AUDIT**

VDA 6.3 audit process defines a standard procedure for conducting of the audits of relevant processes and assessment of the processes capability and performance. This German standard is unique and there has not yet been developed comparable standard for auditing of processes. Process audits are an important instrument aimed to asses of the efficiency of all relevant for customer processes in order to evaluate the process performance, internal incompliances in the process, staff competence, production capacities and others.

Analysis of customer specific requirements in automotive showed, that many OEMs use the standard to carry out the process audits. Conducting of the process audits of suppliers according to VDA 6.3 is a specific requirement of BMW AG (while the organization uses this standard to implement internal process audits). According to the specific requirements of VW, summarized in Formel Q, suppliers must carry out process audits of manufacturing processes according to VDA 6.3 at least once a year. Condition for delivery to Daimler AG allows the customer to perform audits based on VDA 6.3 at suppliers, while Daimler AG has the right to audit the suppliers in the Tier 2 and more suppliers.

VDA 6.3 provides a catalog of standard questions, which covers the following issues [5]:

- P2 - Project Management
- P3 - Product design and planning process
- P4 - Product design and realization process
- P5 - Supplier management
- P6 - Production process
- P7 - Customer care / customer satisfaction / service.

The auditor performs an analysis and evaluation of the production process (P6) according to the sequence of elements: inputs into the process, the process flow / content operations, human resources / support process, material resources, efficiency, output from the process, transfer and disposal / handling the parts. Each relevant question from the list is evaluated on a scale of 0, 4, 6, 8, 10 (where 10 is a complete implementation of the requirements). Fulfillment of the requirements for each area analyzed process is quantified by indexes  $E_x$ .

The  $E_{PG}$  index, which represents the degree of meeting the requirements for a group products in the production process, is calculated as the arithmetic average of the indexes of the assessed performance of each process step.

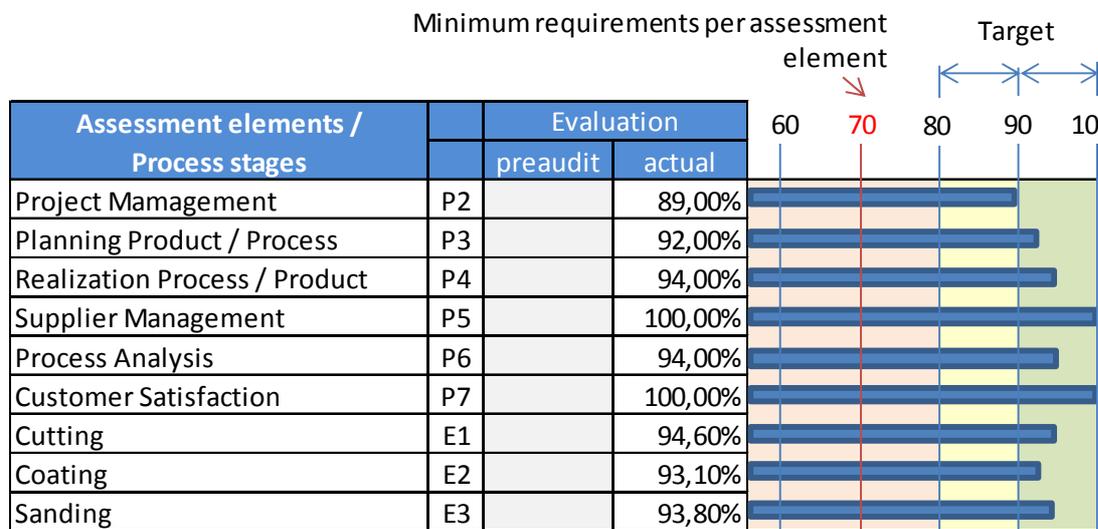
Besides the manufacturing operations throughout the audit process according to VDA 6.3 system issues are separately evaluated, namely the area of project management ( $E_{PM}$  index), product design and planning process (index  $E_{PP}$ ), product design and realization process (index  $E_{PR}$ ), management suppliers (index  $E_{LM}$ ) and customer satisfaction (index  $E_K$ ). The overall level of compliance of evaluated processes is expressed as a percentage of  $E_G$  index.

$$EG = \frac{EPG + EPM + EPP + EPR + ELM + EK}{6} \quad (1)$$

This index represents the average overall efficiency in the above mentioned areas.

Based on the overall index of compliance with VDA 6.3 criteria, the audited processes are categorized as follows: A - eligible (if  $EG \geq 90\%$ ), B - conditionally eligible (if  $90\% > EG \geq 80\%$ ) and C - ineligible (as  $EG < 80\%$ ). The example of the assessment process, cutting and surface treatment developed in xls file for documenting and evaluating of process audit according to VDA 6.3 is shown in Fig. 1 Based on the results of this audit total degree was calculated and was quantified as 95%, and therefore the process was categorized as A.

Figure 1 Example of assessing of the effectiveness of processes (cutting, coating and sanding)



VDA 6.3 standard is applicable to auditing of internal processes (to assess the performance of internal processes) as well as external audits realization by customers. This standard is not intended for certification, although very often applied in particular in the evaluation and selection of suppliers as a proven tool for improving of the quality of supplied materials and services, and as a tool to prevent mismatches and thus claims, and building a culture of customer involvement in improvement of suppliers' processes.

### PROPOSAL FOR INTEGRATION OF VDA 6.3 BASED PROCESS AUDITS INTO SUPPLIERS ASSESSMENT SYSTEM

As noted above, VDA 6.3 provides a formula to assess the effectiveness of the processes and the subsequent evaluation and categorization of processes. This makes it easy to implement the standard in the evaluation and selection of suppliers, both at the stage of preliminary evaluation and selection of suppliers, as well as in the context of regular ongoing evaluation of selected suppliers.

Suppliers are generally assessed on the basis of predetermined criteria. According to Nenadál (2006) these criteria might include the effectiveness of quality management system, delivery time, payment terms, the index of the full cost, scope disagreements and many others. There is no doubt that good corporate results are largely conditioned by the appropriate choice of suppliers and mutually beneficial relationships [13].

If the supplier has a certified quality management system, it is expected, that the supplier fulfills the minimum requirements for fundamental processes of quality management. However, from the customer perspective is important that the supplier demonstrates its capability of manufacturing processes and operations that are directly involved in realization of the products the customer. In this case, it is appropriate as one of the selection criteria and evaluation criteria for suppliers to measure suppliers' processes efficiency, which can easily be assessed on the basis of standard VDA 6.3.

Including of the results of process audits into the system evaluation and selection of suppliers allows the quantification of system components as well as product realization processes at the supplier, so allows choosing the supplier with the highest

potential. Moreover, carrying out of regular audits of suppliers helps to develop supplier's potential in a systematic and continuous improvement of processes. The example of selection and evaluation suppliers is shown in Fig. 2

Figure 2 The evaluation and selection of suppliers with respect to process efficiency

Assessment element	Unit of measure	Minimum requirement	Categorization			Weight: 1-normal 2-	Evaluation			Max. evaluation	
			50 b	30 b	10 b		Supplier 1	Supplier 2	Supplier 3		
Quality	Certified system	áno / nie	áno	áno	-	-	2	áno	áno	áno	100
	Processes effectiveness Eg	%	80%	>90	85-89	80-84	3	93	95	84	150
	Claims	ppm	100	0-30	31-70	71-100	2	15	32	71	100
Logistics	Distance	km	500	0-150	151-300	301-500	1	230	305	120	50
	Delivery time	dní	10	0-3	4-6	7-10	1	4	4	3	50
	On-time deliveries	% omeškaných dodavok	5	0	1-2	3-5	2	0	0	1	100
Economy	Cost	Eur / ks	5,06	4-4,5	4,51-4,92	4,93-5,06	3	4,89	4,95	4,4	150
<b>Score:</b>							600	520	460	<b>Total: 700</b>	
<b>Supplier category: A: 600-700, B: 500-599, C: 400-499</b>							A	B	C		

Integrating of the results of the audits of the suppliers into evaluation system gives the customer a guarantee of proper assessment of relevant key processes. For example, the supplier 3 in Fig. 2 has a good geographic location to the customer, which resulted in the assessment of distance and delivery time. Nevertheless, the efficiency of processes and the weakest ppm indicator caused lower ranking within on-time deliveries. Despite the lowest price supplier 3 is categorized as C, because inefficiently set key processes failed to ensure a high enough quality indicator expressed ppm and caused delivery delays.

Taking into account all the factors described in this article, the possible benefits of supplier process audits can be summarized as follows:

- Process Audits of suppliers make it easy to identify the risks that may occur within the audited processes, and timely to address potential problems.
- The audit report provides in-depth analysis of the audited process so that they can be developed effective measures to improve process performance.
- Potential risks identified during the process audit and timely solution will help avoid complaints and possible downtime in production caused by errors suppliers.
- The process audit allows identifying waste in the process and for their removal increases the efficiency and effectiveness of the audited process.
- The audit process in accordance with VDA 6.3 fully satisfies the requirement to carry out process audits by the customer in accordance with ISO / TS 16949.
- Ratings of the audit according to VDA 6.3 can be easily integrated into the supplier evaluation.
- Based on results from several audits, it is also possible to determine the progress in numerical form.

Supplier evaluation system should be a two way process of feedback that leads to continuous improvement. Supply conditions should always be clearly defined, including the necessary documentation. An important step is correct delimitation methods and tools to monitor supplier quality levels [1], including the evaluation of processes effectiveness.

Elimination of risks and uncertainties related to the performance suppliers is an important area of supply chain management [15]. Prevent risks and streamline processes of suppliers is particularly important in the context of the concept of JIT (Just-in-time). Choosing the right suppliers significantly reduces acquisition costs, increases market competitiveness and increases end user satisfaction. However, the fundamental problem of supplier evaluation systems is the human factor in assessing of quality parameters, assess the performance of the supplier can be quite difficult for the assessor [14] respectively selected indicators may not be representative of the actual state of key processes in the organization. Integrating the results of process audits suppliers to supplier evaluation system eliminates these risks.

## CONCLUSION

It was verified, that the best level of application of the principles of quality management is in the automotive industry, which follows logically from the more stringent requirements specified in the technical specification ISO / TS 16949. Organizations to withstand tough competitive struggle and achieve sustainable development must be adapted to the

requirements of the international market and bring about change management methods and business philosophies [9]. Effective improvement methods special for the automotive industry, however, under certain conditions, are applicable in other industries. Correct application of methods and tools specific to the automotive industry and adaptation of these tools to the needs of the organization can help to improve the quality management system and organizations operating in other industries. As a matter of fact, VDA 6.3 is a standard widely used in the automotive industry (especially in German OEM supplying companies). There is no doubt that integration of supplier evaluation can contribute to the development of partnerships with suppliers and customers involvement in the process of improvement. This standard usage for suppliers' evaluation may be crucial in the development effective partnership between customers and suppliers.

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