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Development of a Supplier Performance Evaluation Process in the Case Organization

Helsinki Metropolia University of Applied Sciences

Master's Degree

Industrial Management

Master's Thesis

02 May 2019

The whole study process and the time given for the study overall has been within a limited time frame. It has gave me a great opportunity to increase my time management skills and ability to operate under the pressure, moreover, I got the chance to obtain professional knowledge and skills for my career prospects. A whole study process overall would not be achievable without the excellent guidance from all IM instructors PhL. Zinaida Grabovskaia, Dr. Thomas Rohweder, Dr. Juha Haimala and Dr. James Collins. Instructors gave great knowledge, feedback and insights through the whole study period.

Especially, I would like to thank to my thesis supervisor Dr. Thomas Rohweder for the excellent expertise, feedback and guidance through the process. It was a privilege for me to share our business knowledge and to work on the project together. Additionally, I would like to thank PhL. Zinaida Grabovskaia and Dr. James Collins for the feedback and support given for the thesis writing process.

As well, I would like to thank the case organization, which allowed to develop my thesis idea within their business environment. And I would like to thank the management and every informant in the case company for participation of this project.

Moreover, thanks to my husband Joni. Thank you for the great support, encouragement and patience through the whole year of my studies.

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Helsinki

May 02, 2019

Author Title	Monta Briede-Kukko Development of a Supplier Performance Evaluation Process in the Case Organization
Number of Pages Date	69 pages + 8 appendices
Degree	Master of Engineering
Degree Program	Industrial Management
Instructors	Dr. Thomas Rohweder, Principal lecturer Zinaida Grabovskaia, PhL, Senior lecturer Dr. James Collins, Principal lecturer
<p>This thesis focuses on the development of a supplier performance evaluation process in the case organization, which does not have a standardize approach to measure existing supplier performance. The study is based on qualitative research methods. In the study, semi-structured surveys, interviews and management workshops were conducted. Furthermore, literature was used to get insight and knowledge into various standardized supplier evaluation approaches and best practice.</p> <p>The study was conducted based on three rounds of data collections. Data 1 focused on the current state analysis and examined the current approaches used in the case organization to evaluate supplier performance. In addition to knowledge about the supplier performance evaluation process and best practice, Data 2 focused on information collected from the stakeholders to build an actual proposal. The proposal was built based on co-development with management and purchasers to develop a supplier performance evaluation process to fit the organization's needs. As a result, the supplier performance evaluation process was developed. Data 3 focused on the validation of proposal based on the feedback and development suggestions from the key stakeholders, coupled with the process simulation.</p> <p>With a standardized supplier performance evaluation process, the case organization is able to evaluate the existing suppliers. Furthermore, it allows them to measure at which level the existing suppliers fulfill their performance criteria. Thus, if some of the suppliers are not able to fulfill their performance, corrective actions can be applied. It can improve performance in the organization, decrease operational costs related to claims, delays, stock outs, and ensure other improvements.</p>	
Keywords	Performance evaluation, Performance measurement, Supplier performance evaluation.

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1 Introduction

This study focuses on exploring the supplier performance evaluation system and the main aim is to develop the process to measure supplier performance in the case company.

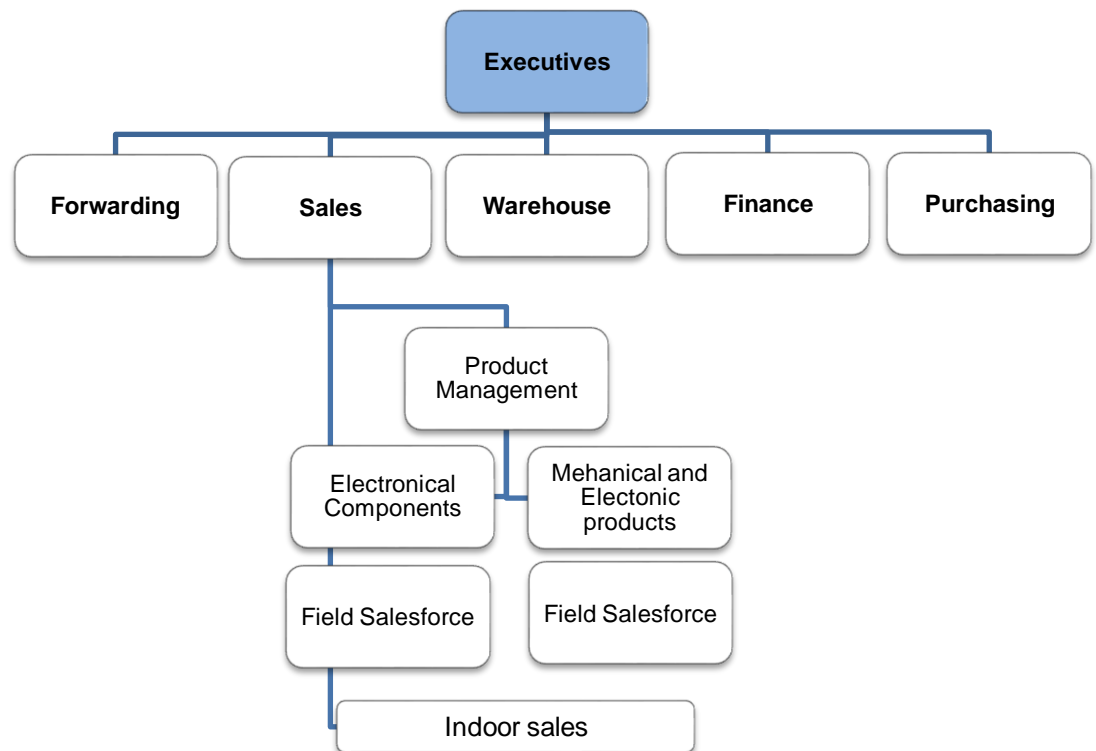
1.1 Business Context

The case organization of this thesis is a medium-sized Finnish subsidiary of the international group with the headquarters based in Germany. The company employs around 110 employees and is located in the southern part of Finland. In 2018, the organization had € 21, 5 million net turnover.

The product portfolio includes around 20´000 different inventory products and other non-stock products depending of demand. The company offers **mechanical**, **electrical** and **electronic components** and products to B2B customers in Finland and Estonia. The **Mechanical product group** includes fastening accessories (screws, nuts, inserts, rivets, washers etc.), plastic and rubber products (board holders, plastic rivets, cable clips, cable anchors, cable ties etc.), supplies (work gloves, capon tapes, packing materials, tools etc.), plastofast, and additional services (coloring of screws, nyseal, drilling power testing etc.). The **Electronic product group** includes cables and cable accessories (glands and grommets, cords, lugs), terminal blocks and accessories (rail-mounted, spring clamp, sensor terminal blocks), industrial sockets etc. The **Electronic component product group** includes passive components (EMC components, power magnetics, signal and communication products, capacitors, resistors), optoelectronics (LED´s, infrared LED´s, ultraviolet LED´s), power modules, electromechanical components (connectors, switches, assembly products, terminal blocks), automotive (PCB ferrites, cable ferrites, coil power inductors), custom magnetics and custom connectors. All products offered are sourced from group companies and third party suppliers.

The case organization consists of four departments – Forwarding, Sales, Warehouse, Finance and Purchasing (Figure 1). Other services, such as marketing and bookkeeping are supported by the Group.

Figure 1 The Case Organization's structure



As seen from Figure 1, the Forwarding department is one of five main departments in the company. The Forwarding department is responsible for planning the most appropriate routes and freight forwarders for shipments from suppliers and to customers, handling of transportation and handling costs and taking care of all customs related matters.

Next, the Sales department is divided into two categories under Product Management – Electronical components, Mechanical and Electronic products. Each of the groups has its own product manager who is responsible for the sales, pricing, product assortment, training and other sales related actions. Further, the field salesforces main responsibilities are existing customer visits, technical customer support, sales plan fulfillment and attraction of new customers. Indoor sales acts as a support for the product management and the field salesforce. Their main responsibilities are sales order input, customer care, and creation of solutions to ensure a well-managed sales process. The Warehouse is responsible for order receiving and unpacking from suppliers and order picking, packing and shipping to customers.

The Finance department handles all bills from suppliers as well as manages smooth billing operations with customers. The Purchasing department employees 8 purchasing specialist, who supports overall supply and sourcing of products and are responsible for supplier selection, contracting and management, as well as price negotiations, order processing, forecasting and inventory monitoring. Responsibilities between purchasers are divided and based on product groups, specific suppliers and the number of products sourced. Each purchaser is responsible for the group of suppliers and around 2000-3000 articles in total.

1.2 Business Challenge, Objective and Outcome

Over the last three years, the case organization's sales volume and number of customers has increased significantly. Along with this, the purchasing process to supports sales has got more challenging because of increasing purchase volume, non-predictable demand and a need to select new suppliers to ensure specific products needed for customers. As a result, the company faces a decreasing service level degree, a larger number of reclamations regarding the product quality, late delivery and price increase as well as the overall supply chain disruptions.

In the case organization, each purchaser's responsibilities include monitoring and measuring performance of suppliers, but practice shows that not all of them do it. Likewise, those purchasers, who monitor and measure supplier performance do it in different ways depending on knowledge, practice and by taking in consideration personal opinion of measures important to follow and the practice to follow-up. The previous process described does not give a clear view of supplier performance as it is disrupted without one common goal and Key Performance Indicators set. Moreover, the organization does not have a single specific process for monitoring third party supplier performance, even though this is essential for the company to develop successfully.

Accordingly, the Objective of this thesis is *to develop a supplier performance evaluation process for the case organization.*

The outcome of this thesis is therefore *the supplier performance evaluation process for the case organization.*

1.3 Thesis Outline

To achieve the objective of this thesis, the current approach and management expectations are collected and analyzed to find the main measures for evaluation of the actual process in the case company. As the next step, research literature on supplier performance evaluation process and systems is studied to find best possible solutions for the case organization's challenges and to develop the supplier performance evaluation process based on the performance criteria's set by the management and purchasing specialists in the case company.

This research questions that contribute to this study include:

- What are the current practices of supplier performance evaluation in the case company?
- What are the management's expectations concerning supplier performance evaluation approach?
- What is the best approach to measure supplier performance for the case company?

These questions are studied by using quantitative research methods for conducting the current state analysis and based on a study of relevant literature.

2 Method and Material

This section describes the methods and materials used in the thesis, and the research approach, research design and data collection used in this study.

2.1 Research Approach

There are different types of methodologies that can be used to conduct a study, for example, *basic* or the so-called *fundamental research*, and *applied research* methods. Basic research is mainly conducted when general research is made regards formulation of theory of issues, and its elements are based on simplification to conduct or increase certain knowledge with less consideration how to apply it. Whereas, applied research focuses at finding a solutions for specific issues that society, and industrial and/ or business organizations are facing and are based on real situations and is absolutely applicable. (Dudovskiy (n.d).)

In each type of research, there is an issue that is solved using different research methods and it generally tells the reason for the research. The main approach to the issue is called a research approach, and depends on the research problem and existing theory applicable to explain the problem. The division between two approaches is entrenched between quantitative and qualitative research methodologies, and, for example, design research can be conducted as a match between both methods. (Kannanen, 2013, p. 27-28)

As for data collection and analysis, there are two empirical research methods, depending of the subjects and disciplines of the research field chosen. Those are *qualitative method* and *quantitative method* (Flick, Von Kardoff and Steinke 2004, p. 3). The qualitative method precisely and deeply describes the research question from the participant point of view, therefore it gives deep understanding of the issue at hand. Regarding qualitative methods of data collection, the most popular include: open, or semi-, or structured questionnaires or narratives, or interviews to the research phenomena. Open interview results give more concrete picture of subjects as everyday life, work processes and others (Flick, Von Kardoff and Steinke 2004, p. 3-6). Quantitative methods, on the other hand, are based on numbers and mathematic calculations by answering to questions as: "How many? ", and "How often? " (Dudovskiy (n.d).), involving irregular sampling and

use structured data collection instruments and fully standardize questionnaires (Flick, Von Kardoff and Steinke 2004, p. 9).

This study is conducted in the field of applied sciences and to apply a solution to real business situation, and thus applied research methods have been chosen. For this study, qualitative research is selected as a research methodology to conduct data collection and analysis.

2.2 Research Design

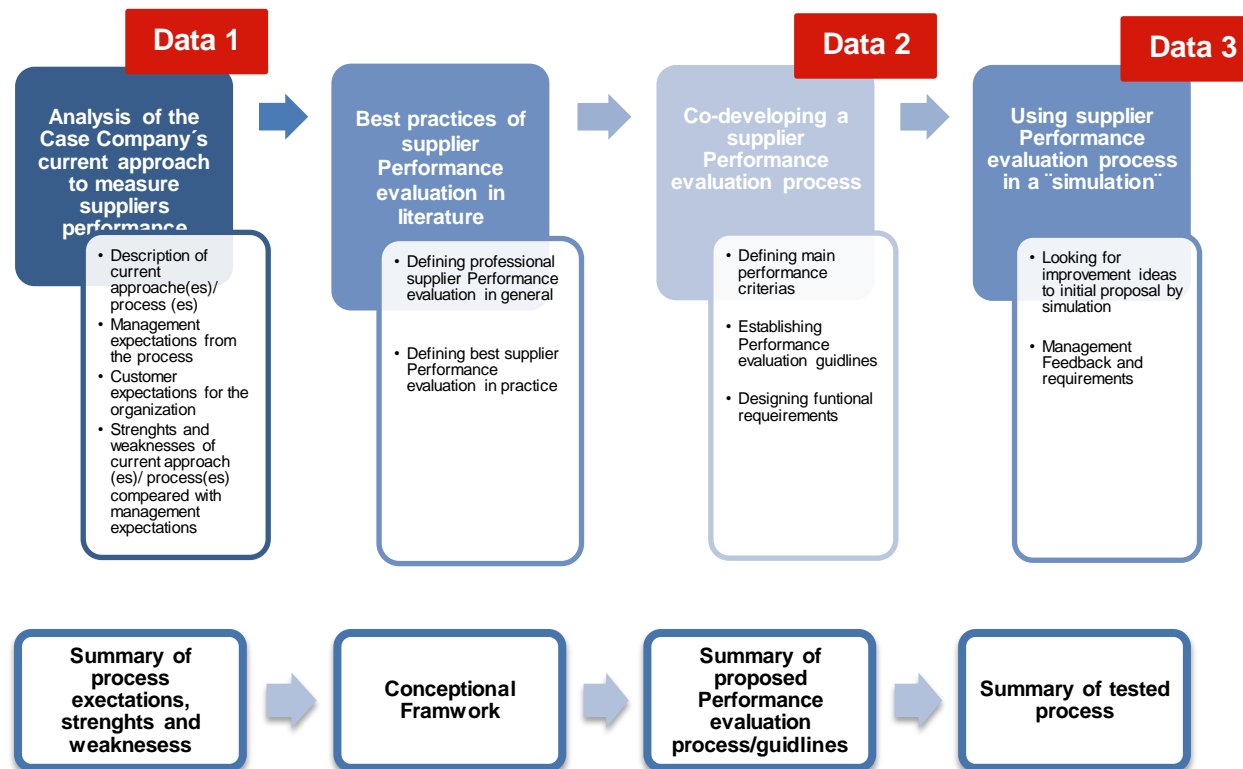
This thesis has a research design shown in Figure 2. It consists of four general stages.

As seen from Figure 2, the research design is outlined with a purpose to reach the thesis objective in a logical and constructive way. At the beginning of the study, the objective was set based on the business challenge, with the aim to develop an internal process.

In the first stage, in order to reach the objective, the current state of the process was analyzed. The purpose of the current state analysis was to describe and analyze the current approach to measure the suppliers' performance by the purchasing department. The current state analysis started with a semi-constructed questionnaires (Appendix 1), which were issued for all purchasers in the case company. Further, investigation continued by one to one interviews (Appendix 2) in order to map the current approaches in detail and to learn about the strengths and weaknesses of those current approaches, from the purchasers' point of view. Furthermore, customer feedback from interviews (Appendix 3) and a satisfaction survey (Appendix 4) conducted by the case organization a little time ago, were analyzed to understand customer expectations. As the next step, the management workshop (Appendix 5) was conducted in order to get the idea about expectations for the supplier performance and the new process of measuring supplier performance. As a summary, the current supplier performance evaluation approaches were compared with the management expectation to identify the strengths and weaknesses of actual process.

The second stage of the project was to build a conceptual framework based on literature regarding best practices of supplier performance evaluation process existing in literature. This step included defining the supplier performance evaluation process in general and the best supplier performance evaluation process from business practice.

Figure 2 Research Design process of the thesis project



As a summary, the conceptual framework was constructed, and combined with a several elements selected from the literature.

The third stage aimed to develop a standardized supplier performance evaluation process for the case company for improving their supplier performance evaluation. During this stage, the main performance criteria for the performance evaluation process were defined, the performance evaluation gridlines were established, and functional requirements were designed. As a summary of this stage, the proposed supplier performance evaluation process was developed. Furthermore, a management workshop and purchaser interviews were organized for the co-development of the process.

In the fourth stage, the proposed process for the management was presented in order to receive feedback, improvement ideas and changes, if necessary. Furthermore, the initial proposal for the standardized supplier performance evaluation process was simulated in order to detect initiation works, the strengths and weaknesses and further improvements before implementation.

2.3 Data Collection and Analysis

The data collection and data analysis of this thesis project was based on the Data plan visualized in Table 1. Table 1 shows the data sources, surveys, one-to-one interviews and management workshops. Every of stages mentioned in Table 1 has a clear source describe and outcome expected from chosen data sources, data collection methods and analysis.

The data collection process shown in Table 1 is divided into three main project stages – current state analysis; building the proposal; and validation.

In the current state analysis stage, data was collected by conducting semi-structured purchasing surveys, one-to-one interviews to understand and describe the current supplier performance evaluation approach in purchasing. To collect data regarding customer expectations from the products and services offered by the case organizations, in addition to the data from the customer survey, interview were used. To collect data on management expectations from the company's purchasing department, suppliers and products overall, management workshops were organized. As a summary, the purchasers' survey and interview answered questions about the current supplier

Performance evaluation approach. To this end, the data was collected and analyzed, furthermore these data were compared with the management expectations to describe the strengths and weaknesses of the current approach.

Table 1 Data Plan of the thesis project

	CONTENT	SOURCE	INFORMANT	TIMING	OUTCOME
CURRENT STATE ANALYSIS	<ul style="list-style-type: none"> • Description of current approach to evaluate supplier performance; • Defining Customer expectations • Defining management expectations; • Strengths and weaknesses of current process. 	<ul style="list-style-type: none"> • Purchaser survey results; • One to one interviews with purchasers • Management workshop 	<ul style="list-style-type: none"> Purchasers Purchasing manager Management 	JANUARY/ FEBRUARY	Summary of current approach to evaluate supplier performance, process strengths and weaknesses
BUILDING PROPOSAL	<ul style="list-style-type: none"> • Defining roles & responsibilities • Process of supplier performance evaluation • Defining main performance criteria 	<ul style="list-style-type: none"> • Literature reviews and case studies • Management Workshop (II) • Purchasers´ survey and second interview results 	<ul style="list-style-type: none"> Management Purchasers 	FEBRUARY/ MARCH	Initial proposal of a partially developed supplier performance evaluation process
VALIDATION /FEEDBACK	<ul style="list-style-type: none"> • Process improvement ideas to initial proposal 	<ul style="list-style-type: none"> • Simulation • Management meeting 	<ul style="list-style-type: none"> User Management 	MARCH/ APRIL	Final proposal of a partially improved performance evaluation process

In the building proposal stage, information was collected from literature and best practice about the supplier performance evaluation process in general, about its development and important measures to take in consideration before the implementation process. As the main source of data, purchasers´ interview and management workshop data were used as data source, and to ensure the process success also by taking in consideration management expectations for the supplier performance evaluation. As an outcome of this stage, the initial proposal for the supplier performance evaluation process was developed.

The results from the current state analysis are discussed in Section 3, next.

In the current state analysis (CSA), the data about the actual supplier performance evaluation process in the case company and management expectations of suppliers and supplier performance evaluation was collected and described.

3 Current State Analysis of Supplier Performance Evaluation Practices in the Case Organization

This section discusses the current state of actual supplier performance evaluation process in the case company. Sub-section 3.1 briefly describes the current state analysis stage. Sub-section 3.2 reports the current company supplier performance evaluation approaches. Sub-section 3.3 defines the management expectations for supplier performance evaluation approaches, their goals, business and customer needs. Sub-section 3.4 compares the current supplier performance evaluation approach with management expectations. Sub-section 3.5 reports the summary of the current state analysis.

3.1 Overview of the Current State Analysis Stage

The main purpose to conduct the current state analysis (CSA) was to describe the supplier performance evaluation process/ approaches as it is currently handled in the purchasing department. Additionally, the current state analysis helped to identify the management expectations for supplier performance and supplier performance evaluation, the customer expectations concerning the product offering, and the strengths and weaknesses of the process/ approaches compared with the management expectations.

CSA data were collected using three approaches: semi-structured questionnaires, one-to-one interviews, and a workshop. In the first stage, semi-structured purchaser questionnaires were issued for six purchasers and their answers were analyzed. In the second stage, one-to-one interviews with purchasers were organized, where questionnaire answers were discussed by including additional questions to better understand each of the current supplier performance evaluation approaches in the case company. Afterwards, each of the approaches explained by purchasers were compared and compiled within five approaches. In the third stage, the management workshop was organized, where the management expectations for supplier performance and supplier performance evaluation system were discussed and the main KPIs defined.

Data 1 for this section was collected from semi-structured questionnaires (Appendix 1) followed by one-to-one interviews (Appendix 2) with seven purchasers from the case

company. In the analysis process, four different approaches were identified. Given the above, four current supplier performance evaluation approaches are described in the sections below.

3.2 Description of the Current Supplier Performance Evaluation Approaches in the Case Company

Presently, there are four different supplier performance evaluation approaches in the case company currently.

3.2.1 Approach 1

When Approach 1 is utilized, the purchaser observes the number of claims from the organization's Intranet system. Intranet information collected shows details as to the number of claims per specific year and the specification of those claims (late delivery, quality, wrong quantity sent, price error etc.) can be seen. In this specific approach, actions are taken on special occasions only, such as upcoming supplier meetings or actual claims. In the case of an upcoming supplier meeting, the purchaser opens a discussion about the claim trend (number of claims, type etc.) with the supplier. In most of the cases, the supplier describes the reason for the claim and together with the purchaser agrees on the way how to prevent failures in the future. Nevertheless, no further standardized observation of this specific claim trend is processed or followed up by the purchaser.

Furthermore, when the supplier claim appears, the purchaser sends an e-mail with a description of failure and the requests to solve it within the next 48hrs. If no answer has been given by the time frame, the purchaser will check up by sending an e-mail to the supplier again or makes a phone call.

3.2.2 Approach 2

When Approach 2 is utilized, the purchaser does not use some specific tools to evaluate supplier performance. Information about supplier performance is gained from daily work experience and problem areas identified and written down to further discuss those by phone or within meetings with suppliers. Additionally, claims are studied through the

intranet, similar to as described in Approach 1. To ensure better supplier performance and good relationships, a purchaser tries to meet up with his suppliers quite often - two to four times a year. Communication by phone is done on daily bases.

3.2.3 Approach 3

Purchasers, who operates with Approach 3, mainly uses three measures to evaluate supplier performance – number of reclamations, price trend and response time. Performance is measured on special occasions only as supplier meetings. Reclamations are overviewed through the intranet system tool to see how many claims per year occur. After information is collected, a purchaser discusses it with the supplier in the meetings and agrees further steps. Price trends, on the other hand, are analyzed, when supplier prepares for a yearly price negotiation with suppliers. To analyze a price trend, an ERP analyzing tool, market report of materials and currency are used. Supplier response time is evaluated without special tools, but by simply monitoring the lead time of daily customer care, order confirmations sent and claims solved by the supplier.

In the supplier meeting, a purchaser presents all data gathered for the supplier in the format of a Microsoft Power-Point presentation. The presentation includes information about the price trend, purchase volumes, actual market trend and prices, claims and claim trend. Further, a purchaser points out the weaknesses and informs about expectations of the current supplier service. Moreover, the purchaser and supplier agree about preventive actions of weak points in the future. Nevertheless, no further follow up approach is used.

3.2.4 Approach 4

Purchasers, who operates with Approach 4, monitor supplier claims and does this on special occasions only. Purchasers use intranet system tools to perceive the number of claims occurred within the year. From the information gathered, the purchaser evaluates supplier performance – is it acceptable or not is based on their own judgement. And they further discuss it with a supplier in a meeting.

3.3 Customer Needs Concerning the Case Organization's Service and Product Offering

This section describes customer needs concerning the case organization focusing on the products, value added services and customer care. For this section, data from two different customer surveys done by the case organization was used. Section 3.3.1 describes the data gathered from the customer interviews (Appendix 3), which was a part of the organizations project to encourage company's sales drive and to build a culture of a passion. Section 3.3.2 describes the data gathered from the latest customer satisfaction survey (Appendix 4), conducted on a yearly bases.

3.3.1 Customer Needs Assessment Conducted by the Interviews

In 2018, the Case Organization ran a project to encourage a sales drive by their employees and to build up a culture for a sales passion. As a part of this project, the customer phone interviews and meetings were organized. Conversations took around 45 min of respondents' time, and the main objective was to understand firstly - *“What does customer expects from the organization?”*, and secondly, *“How the organization can help their customers to fulfill their development plans?”*. To answer this interview objective, questions were related to topics such as: Value creation and expectations - the best sales process for a new customer; Value creation and expectations - the best sales process for an existing customer; How to develop best partnership?; How to receive more RFQ's; and How to get them accepted? From the interview results, part related to customer expectations were applicable for this project.

As a result, customer expectations from the case organization were clearly defined and grouped as per priorities from the customer perspective. Customer priorities are: 1) Fast delivery; 2) Reliability of delivery; 3) Quality/ Price; 4) Customer service.

3.3.2 Customer Needs Assessment Conducted by the Survey

Lately (28.02 – 08.03.2019) the case organization conducted a survey to evaluate the customer satisfaction of the services offered. The survey was sent to 4929 customers. As a result, 337 customer responses were received, 6.84% of total respondents. The response rate is slightly below the target, which usually is 10-20%. However, the number of responses to the survey is quite significant, so the result can be considered as reliable.

The survey consisted of 13 questions based on the customer business area, services and articles bought from the case organization, overall experience with customer service – telephone sales, sales representative visits, and the organization’s service fulfilment for customer business needs. In this thesis project, only part of the feedback gathered from the survey was used, however in the free feedback section customer has been noted what are the fields of organizations services they are satisfied, and what does not satisfy them appropriately.

In summary, customer feedback with regards to expectations and comments are summarized in Table 3 below.

Table 3 Customer expectations and comments received from the customer survey

Customer expectations	Customer comments
Price level	<i>“Unfortunately, the price level is quite high for us”</i>
Reliable delivery dates and product information	<i>“No delays informed to us beforehand. Almost every other order should be asked! Information about product changes is important.”</i> <i>“Orders will not arrive as confirmed. The new delivery time is only available after information request”</i> <i>“ Small-order orders always arrives quickly and precisely with the right content, and I have never had to complain.</i>
Samples	<i>“Full-featured sample services have often influenced component choices”</i>
Customer service	<i>“Good service from sales contacts. Messages are answered quickly and expertly. The seller keeps in touch even though no orders have come much recently. ”</i> <i>“The online shopping option with a connection with our ERP would be grate”</i>
Product lead time	<i>“The delivery time for a couple articles is incredibly long and the cost of importing is too high.”</i> <i>“If there is a need for a product that is not available from warehouse in Finland, delivery times are unreasonably long and the offer takes many days. Comparing with a market, this works badly and we are constantly using another suppliers.”</i> <i>“There are often shortcomings in the “Shelf Service”, lack of stuff or excessive amounts of excessive consumption.”</i>
Packing size	<i>“For certain products, pack sizes are too large for our company.”</i>

As per Table 3, most of the customer concerns and dissatisfaction are related to reliable delivery dates, order lead times, price and packing sizes. First, customers complain the most about the lack of information given before the order delay, and the lack of product change notices. Second, product lead times have been too long, especially for the product groups that are not stored in the warehouse located in Finland, as well as the lack of Shelf Service fulfillment. Third, too high a price and packing size has been noted as unreliable for a couple of customers.

3.4 The Management Expectations Concerning Supplier Performance Evaluation

The management expectations for suppliers, supplier performance and supplier performance evaluation process were gathered for this study. Data used for this section was gathered from the management workshop (Appendix 5).

Accordingly, with the data plan of this project, a management workshop (Appendix 5) was organized to introduce management to overall planning of the project as well as to gain information about management expectations of: 1) suppliers; 2) supplier performance and 3) the supplier performance evaluation process as a result of this project. At the workshop were stakeholders such as the organization's CEO, Sales Manager and the Lead buyer of the purchasing department.

Although those participating in the workshop represented three different fields in the organization, it was clear that the organization is sales oriented. Therefore it is necessary to fulfill customer expectations of the products and services offered. To ensure customer satisfaction, management decided guidance from customer interviews (reported in the section 3.3.1) and agreed that the most important measures that had to be taken in consideration when evaluating the organization's supplier's performance, are: delivery time, reliability, product quality and price to ensure competitive advantage among the competitors.

First of all, when the topic of suppliers overall were discussed, the sales manager mentioned that for the case organization it has always been important to gain trust with sales partners and customers, therefore the most important guideline to select and to evaluate suppliers are trustworthiness and loyalty between the case organization and suppliers. All other parties, participating agreed to the statement. However, this left an open question "How to measure trust?" Secondly, as an important supplier criteria for

the CEO is a supplier's willingness for a partnership and collaboration instead of a traditional and simple customer-supplier business model.

As the final topic on the workshop session, management expectations of the planned supplier performance evaluation process were discussed. At first, management expected to have a process that offers full traceability of total data collected and analyzed. Further, data can be used in management reports and for decision-making. Second, a supplier performance evaluation process should be simple and flexible, thus priorities and measures can be changed as per the organization's business needs. Additionally, in the future the same performance evaluation process should be handy in order to be implemented into other departments of the organization. Third, the CEO expected a well-managed change management process when a co-developed supplier performance evaluation process is going to be implemented in the organization.

3.5 Analysis of Current Supplier Performance Evaluation Approaches: The Strengths and Weaknesses as Compared with Management Expectations

In this section, analysis of current supplier performance evaluation approaches compared with the organization's management expectations are described based an analytical approach. As a result, the strengths and weaknesses have been explored. This analysis is done to clarify the next steps of developing supplier performance evaluation process and to answer questions such as – is it possible to improve the current supplier performance evaluations approaches and use those as a base for the new process, or should the process be developed as new, based on other knowledge and approaches to fulfill management expectations.

3.5.1 The Strengths of Current Supplier Performance Evaluation Approaches

In this sub-section, the strengths of current supplier performance evaluation approaches are discussed comparing these with customer and management expectations.

Four current approaches of supplier performance evaluation (section 3.2) were analyzed and their strengths were detected. The strengths of the current approach to evaluate supplier performance are: 1) availability of various evaluation and information collection

tools; 2) developed quality system and purchasing requirements for purchasers; 3) available IT support and other resources; 4) stock fulfillment measured.

At first, the case organization owns licenses of different IT tools such as, enterprise resource planning (ERP) software with additional analysis tool developed, a supply chain planning system and Intranet platform. Currently, the IT tools mentioned are used for daily purchasing operations for data collection about supplier on special occasions such as supplier meetings (3.2.1 Approach 1); (3.2.3 Approach 3); (3.2.4. Approach 4) only. These tools offer other transactions and application options, which are not used currently, but can be developed for application to collect information about supplier performance and to evaluate information collected – precision of delivery confirmed, availability level of articles from suppliers, price level development etc.

ERP procurement functionality covers all purchasing activities for department. Activities includes - determination of purchase requests, vendor selection, purchase order processing and monitoring, goods received and invoicing. As a result, all data with regards to process times for actions mentioned before are recorded and available for evaluation. For article planning, a supply chain planning system is used. In this system, all base information about articles and orders is received from the ERP system, and analyzed based on request. The supply chain planning system creates automatic forecasts for stored articles, monitors overall stock information to notice overstock and/or stock-outs, plans stored articles, reads precisions of order line dates confirmed, and others. As a result, the supply chain planning system can be used as an information source about articles and their suppliers. The intranet platform ensures data input and collection about supplier, claims, article questionnaires, price lists etc.

Additionally, the intranet system offers an option of total data import from the ERP. Secondly, the case organization has an internally developed quality system, which involves the requirements for overall work processes and compliance in the organization. Furthermore, there are purchasing requirements developed by the international group in which the case organization is a member. Both documents set a base for processual requirements. Thirdly, the case organization has daily IT support ensured internally and by the international group. Therefore, custom IT solutions can be developed and implemented into existing tools effectively. Fourthly, stock fulfillment is already measured by the existing system's solutions, therefore it can be used in the supplier performance evaluation process.

In summary, the supplier performance criteria important for the management are: 1) delivery time, 2) reliability, 3) product quality and price. The criteria shall be used as a performance criteria for the supplier performance evaluation process, as there are IT applications available to collect and evaluate data. Additionally, full data, process and process result can be developed to be flexible and traceable with IT solutions owned by the case organization, as those offers full support and technical assistance.

3.5.2 The Weaknesses of Supplier Performance Evaluation Approaches

In this sub-section the weaknesses of the current supplier performance evaluation approaches are discussed comparing these with customer and management expectations.

Four current approaches of supplier performance evaluation process (section 3.2) were analyzed and weaknesses were detected. The weaknesses of current approaches to evaluate supplier performance are: 1) unspecified KPI's from management except stock fulfillment; 2) Four totally different approaches in practice, but no one of those does not specifically evaluate supplier performance; 3) All purchasers "evaluates" the supplier on special occasions only; 4) Unmeasurable and incomparable results of approaches practiced by purchasers; 5) No use of the many IT tools available; 6) Lack of training of personnel concerning supplier performance; 7) Lack of information flow between management and purchasers.

At first, no key performance indicators for suppliers are set in the organization to focus on. Hence, each of the purchasers decides individually as to whether the supplier performance is acceptable or unacceptable, and what kind of corrective actions (if any) to add. The current purchasing practice within the organization, as the measure of the department's performance, is based on stock fulfillment only. From the actual set up, stock fulfillment or so called service degree of supplier, could be used to measure actual supplier ability to meet the organization's demand. Nevertheless, none of the approaches did relate it with a supplier's performance.

Second, in the purchasing department there are four different approaches practiced, when supplier performance is evaluated, nevertheless neither one of those gives measures to use to evaluate supplier from a performance evaluation point of view. For instance, Approach 1 (3.2.1) observes information with regard to number and type of

claims, but neither one of those measures are analyzed and supplier performance evaluated based on those.

Third, there is no specific schedule of evaluating supplier performance; mostly observation of supplier performance is done on special occasions only. Special occasions, in this context, means supplier meetings or new supplier claim.

Fourth, the results received by approaches are not measurable and comparable, moreover these do not give information about supplier performance level.

Fifth, purchasers do not fully use the IT tools available to track supplier performance measures. In the interview, purchasers described that insufficient training or no training had practiced, as a result tools are not used in daily practice. Additionally, two purchasers did not have an account opened for the largest of the analyzing tools in the ERP.

Sixth, as the next weakness, a lack of supplier knowledge with regards supplier performance has been detected. Purchasers have not received training or any information regarding supplier performance, supplier performance evaluation or performance practice overall.

Seventh, the purchasers did not have information about management plans to develop the business in the future and what is expected from them because of growth, nor about the business strategy the company follows. In fact, purchasers knew about the organization's plans to increase sales, number of customer and number of employees in the future. Regarding purchaser performance, some of purchasers interviewed knew that management expects a service degree level of 98, 5% calculated from stock fulfillment, managed stock value and managed stock turnover.

3.6 Summary of the Strengths and Weaknesses of the Current Supplier Performance Evaluation Approaches and the Management Expectations

This sub-section provides an overview of main weaknesses and strength identified in the current state analysis in Section 3.

All data gathered from the current state analysis is summarized in Table 4. Table 4 has been divided into three different sections – summary of weaknesses; summary of

strengths and management expectations from the organization's suppliers, and the supplier performance evaluation process.

The main weaknesses of the current supplier performance evaluation approaches are four – standard Key Performance Indicators (KPIs) for supplier performance are not defined; there are four different approaches used currently for supplier evaluation; approaches have been used for supplier performance evaluation on special occasions only, and most of the information collected by those are not measurable and/ or comparable.

The main strengths of the current supplier performance evaluation approaches and overall situation in the organization are five – from the purchasers interviews, it was clear that there are many IT tools available, which can be used to evaluate supplier performance; there are quality system and purchasing requirements developed, there are technical support and resources available for technical development; management is on board with the development of a supplier performance evaluation process and willing to implement it in other departments, if successful; in the actual ERP set up, there are stock fulfillment measures, which results such as service degree given to purchasers, but it can be used as an measure for supplier performance.

The main management expectations from suppliers are based on customer expectations regarding the organization's given service and the products offered. The company's suppliers are expected to be trustworthy, loyal and willing to collaborate, furthermore the organization's purchasing department should build supplier-buyer relationships based on those measures. Moreover, suppliers must be able to ensure short lead times mostly, must be reliable and offer good quality products with adequate price. With regards the supplier performance evaluation process, all data gathered should be traceable, the process should be simple and flexible as well as implemented using good practices from change management and by following project implementation logic, which in this case is Gate-model logic.

In fact, there is no specific approach currently that could be used as a standardized process to evaluate supplier performance. The reasons are: neither of the approaches follow specific KPIs as these are not defined, as well all information gathered are not measurable or comparable and results are based on purchasers own judgement. In fact, you cannot evaluate, if there no measurements has been done. To conclude, the supplier

performance evaluation process should be developed as a brand new process for the company based on the current state analysis weaknesses. Nevertheless, the supplier performance evaluation process should be developed using the strengths and by taking in consideration management expectations.

Chapter 4 is based on literature relating to supplier performance evaluation, process development and best practices to develop processes based on practices and best knowledge.

Table 4 The Summary of S&Ws from the current state analysis

OUTCOME OF CURRENT STATE ANALYSIS		
SUMMARY OF WEAKNESSES	SUMMARY OF STRENGTHS	MANAGEMENT EXPECTATIONS
<ul style="list-style-type: none"> • Standard KPI's not defined for supplier performance; • Four different approaches to evaluate supplier performance; • Performance evaluated in special occasions only; • Most of information collected is not measurable and does not give clear information of supplier performance. 	<ul style="list-style-type: none"> • Various tools available; • Quality system, and purchasing requirements developed; • Technical support and resources available; • Management "on board" with a project and willing to implement it through the organization; • Stock fulfillment measured. 	<ul style="list-style-type: none"> • Performance priorities: <ul style="list-style-type: none"> - trustiness, loyalty and collaboration; - Short lead time; - Reliability; - Quality; - Price. • Process should be simple and flexible – priorities could be changed; • Change process should be implemented by using change management practices and process model (i.e. Gate- Model logic).

4 Best Practice on Supplier Performance Evaluation Process

4.1 Overview of Best Practice on Supplier Performance Evaluation Process

This section discusses the best practices on supplier performance evaluation processes found from literature. This section has seven sub-sections. Sub-section 4.2 briefly describes an overview of steps in existing supplier performance evaluation approaches. Sub-section 4.3 reports process step 1, conducting supplier prioritization. Sub-section 4.4 describes process steps 2 and 3, establishing and prioritizing supplier performance evaluation criteria. Process step 4.5 reports process step 4 and 5, collecting and evaluating supplier performance data. Sub-section 4.6 reports process steps 6 and 7, consolidating, reporting of supplier performance results and taking corrective actions. Sub-sections describes the conceptual framework summarized for this thesis project.

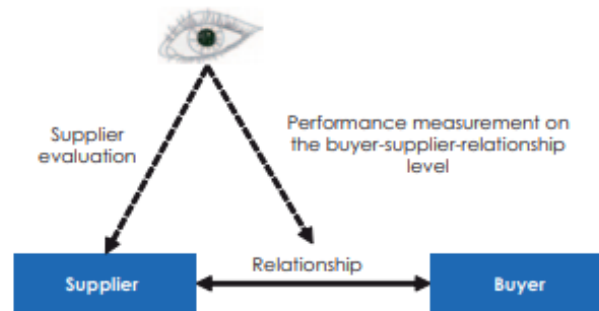
4.2 Overview of Process steps in Existing Supplier Performance Evaluation Processes

In the business literature and from the best practices, there are many concepts, processes and methods used for supplier performance evaluation. For the context of this thesis, few of them were found especially useful to develop the supplier performance evaluation process in the case organization.

Hofmann et al. (2014) talk about supplier evaluation and performance measurement and the buyer-supplier relationships. They claim that in addition to a company's internal performance factors, overall organization's performance depends on the suppliers' performance and the supplier-buyer relationships. Supplier-buyer relationships contributes value, which should be taken in consideration and evaluated. Concepts, which focuses of supplier-buyer relationships are supplier relationship management, upstream supplier management and interface management. Supplier relationships management focuses on all supplier relationships across business areas with an aim to ensure manufacturing of products: better, faster and with a lower costs based on well managed collaboration with suppliers. (Hofmann et al. 2014, p. 94-95). Hofmann et al. (2014) present practicable methods and ratios to measure and to evaluate suppliers, including the relationships between supplier and buyer as per Figure 3.

Hoffman et al. (2014) talk about unpredictable costs and benefits of supplier performance evaluation process and therefore suggests to run supplier sorting based on priority (ABC analysis) to detect suppliers for evaluation.

Figure 3 Overview of supplier evaluation and performance measurement based on supplier-buyer relationships (Hoffman et al. 2014).



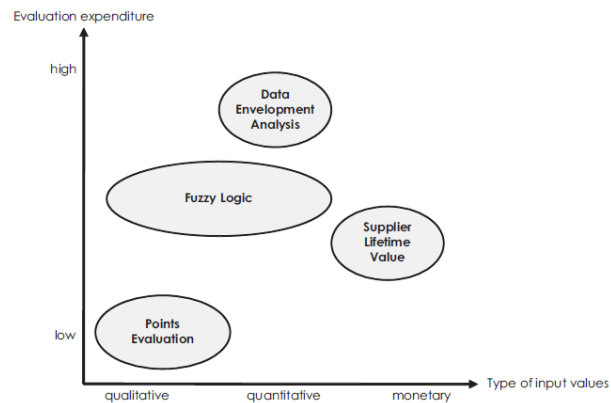
As an example, supplier sorting can be based on total procurement value (Hofmann et al. 2014, p. 95.), moreover, other important measures can be selected additionally. For the next process step Hoffmann et al. (2014) suggest to establish evaluation criteria and so called Kick-Out criteria. Kick-Out criteria is a filter which separates acceptable suppliers from no-acceptable suppliers for the organization. As an example, if the criteria suggested is ISO 9001 (or any other) quality process implemented in the supplier's organization. As a result, if a potential or existing supplier does not have ISO 9001 certificate, it cannot be accepted as a supplier or the supplier agreement is terminated (for existing suppliers). A significant point by Hoffmann et al. (2014) is the division of responsibilities between organization's corporate areas with regards supplier performance evaluation process - who will be the decision maker of evaluation criteria and who will run the actual evaluation process. (Hoffmann et al. 2014, p. 96)

With regards to the data collection process of existing supplier by Hofmann et al. (2014), empirical data may be used. However, four different methods are presented to measure and evaluate data. These are: point rating system method; data envelopment analysis method; fuzzy logic method and the supplier lifetime value method. (Hofmann et al. 2014, p. 100-110) Additionally, Hoffman et al. (2014) present an allocation graph (Figure 4), which can be used as a tool to select the most appropriate method for supplier performance evaluation.

Further, Hofmann et al. (2014) tell about supplier performance evaluation based on supplier due date faithfulness, quality of goods and service degree in accordance of relationships between procurement organization and supplier, therefore it is suggested to focus on long-term suppliers for evaluation and measurement under more strict

guidelines, compared with suppliers that supply goods occasionally. For the supplier, selection measure as *active supplier in relation to the purchasing volume rate* is suggested. However, the main performance measures are costs, quality and availability, moreover, availability of goods and service are essential for an organization's functional efficiency. (Hofmann et al. 2014, p. 114-116)

Figure 4 Allocation of presented methods for supplier evaluation (Hofmann et al. 2014, p. 111.)



Monzka et al. (2009) talk about supplier evaluation and selection based on strategic sourcing. This source claims that the most significant processes for the organization overall are: measurement, evaluation, and analysis of suppliers continuously.

“Supplier performance that is good enough today will not suffice in the marketplace of tomorrow.”

(Monzka et al. (2014), p. 308)

As an example, Honda's practice highlights the key points about supplier management and development: 1) suppliers are important for an organization to succeed, thus attention to supplier's performance is needed; 2) a large and complex supplier base leads to inadequate supplier development support; 3) a supplier requires commitment and resources to make the process successful (Monzka et al. 2014; p. 306-308.). Additionally, as per Monzka et al. (2009) it is significant to consider the difference between a one-time process - supplier measurement and continuous process - for supplier evaluation.

As well, Hoffman et al. (2014) and Monzka et al. (2009) talk about methods to collect performance data for evaluation. They suggest to use empirical information of existing suppliers. Additionally, supplier visits, preferred supplier lists and preliminary supplier

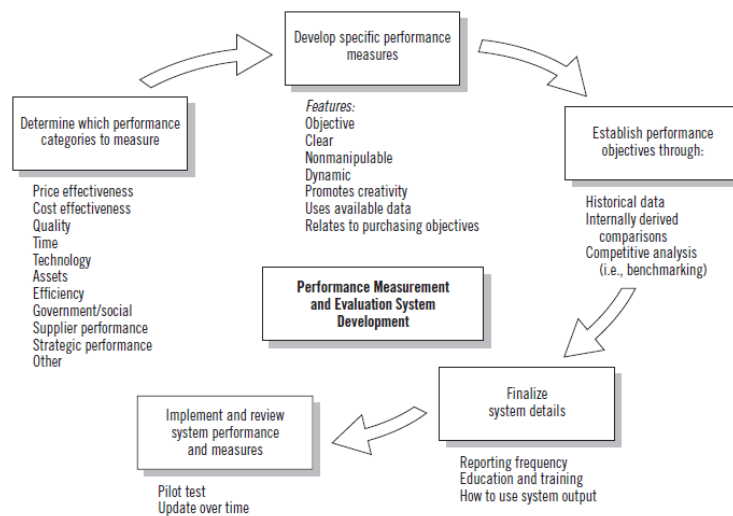
surveys can be processed (Monzka et al. 2009, p. 245 - 247). Hofmann et al. (2014) suggest Kick-Out criteria as a filter criteria for suppliers, however, Monzka et al. (2009) call these criteria *Entry qualifiers*, which are criteria developed with a similar manner. A supplier has to fulfill both, Kick-out criteria and Entry qualifiers to be selected for the supplier base and for the further evaluation process – supplier evaluation and selection. Entry qualifiers can be based on financial strength, appropriate business strategy etc. *Entry qualifiers* are suggested to limit time and costs related with supplier evaluation.

The buyer organization has to have different tools to measure, manage and develop performance of suppliers. Without an effective, well developed measurement system, which is able to record and evaluate supplier performance, buyers do not have information regarding satisfaction of the organization's needs as per Monzka et al. (2009). The same authors focuses on supplier measurement decisions, such as: what to measure, how to weight various performance categories, how frequently to measure and report and how to use all data of supplier performance (Monzka et al. 2009, p. 309-311). Three key measurement criteria are: 1) cost of price, 2) quality and 3) delivery, as these three areas mostly affects purchaser. For critical items, in-depth analysis of supplier capabilities may be needed. (Monzka et al. 2009, p. 248) As an example, Hewlett-Packard has developed a supplier performance evaluation model based on six performance categories. Those are: 1) Technology contribution; 2) Quality; 3) Supplier responsiveness, 4) Delivery performance, 5) Cost and 6) environment performance. (Monzka et al. 2009, p. 722)

Moreover, a supplier scorecard is an important tool to select, motivate and develop suppliers (Monzka et al. 2009, p. 722). Furthermore, supplier measurement techniques such as categorical system, weighted point system and cost-based system are described. Monzka et al. (2009) have also given practical ideas to develop a practical supplier performance measurement and evaluation system. A supplier performance evaluation process should follow ordinary activities set: 1) determination of performance measurement categories, 2) development of specific performance measures, 3) establishment of performance standards, 4) finalization of system details, 5) implementation and review of system and performance measures (Figure 5). Therefore, relating to supplier performance measurement and evaluation system development, Monzka et al. (2009) talk comprehensively, based on an ordinary purchasing and supply chain performance measurement and evaluation systems model.

As per Figure 5, a performance measurement system's development should begin with a determination of performance categories to be measured, following development of specific performance measures, establishment of performance objectives, furthermore finalization of system details such as, how frequent reports will be made, training etc., and as final step – implementation and review of the system. (Monzka et al.. 2009, p. 724-725)

Figure 5 Developing a Purchasing and Supply Chain Performance Measurement and Evaluation System (Monzka et al. 2009, p. 725)



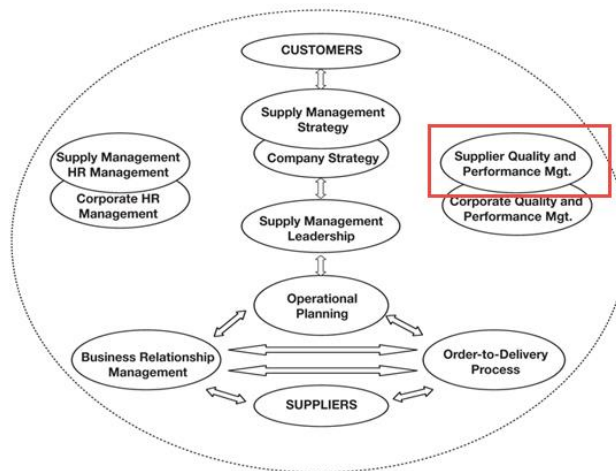
In contrast, Gordon (2008) talks about supplier evaluation as a part of a supplier performance management process involving both parties – supplier and buyer organizations, and claims that the whole performance process should be well managed and cross-functional on both sides. To enable good supplier performance, a buyer organization has to have supply management knowledge, as supplier performance does not depend on the supplier only, claims Gordon (2008), based on practice gained from New England Supplier Institute (NESI). As a result of work in NESI, the Supply Management Improvement Process has been developed to identify supply management capabilities and bottlenecks on the buyer's side and to improve those. To illustrate, the functional model is presented at Figure 6 - The Supply Management System Framework, which has been used as the main instrument to develop the Supply Management Improvement Process.

As per Gordon (2008), the model presented at Figure 6 outlines the skills, competencies and requested behavior by the customer to permit exceptional supplier relationships,

good supplier performance and performance improvements. To focus on Supplier Quality and Performance Management, according to the model, it is responsible to monitor that materials purchased and supplier services would be at the level agreed.

An organization's quality and performance management shall ensure feedback in-time for suppliers regarding any underperformances. Moreover, a buyer must track and provide feedback about supplier quality, on-time delivery, service responsiveness and other important activities (Gordon 2008, p. 22).

Figure 6. Supply management system framework (Gordon 2008, p. 20)



Regarding the structure of the supplier performance management program and evaluation process, Gordon (2008) mentions the importance of critical factors such as management support and the need to have a clear and defined process. It is suggested, additionally, that the use of a supplier data scorecard, use of the ERP or financial system is significantly important to collect information. As data collection is only one step from the process, the action has to be made with information collected. Gordon (2008) suggests that procurement may be responsible for supplier relationships, likewise - quality, accounting, warehouse and other stakeholders should be involved in the process, as they are impacted by supplier performance daily and the other way around. Thus, these stakeholders may look on supplier performance from their unique way and can give additional value to performance expectations that are important for the organization. (Gordon 2008, Chapter 3)

As per Gordon (2008), the main steps to develop a supplier performance management plan are as follow: 1) Initiate project plan and kickoff; 2) Segment the supply base; 3) Develop evaluation strategy 4) Define performance expectations; 5) Define KPIs and

scorecards; 6) Develop data collection instruments; 7) Plan transition from metrics to action; 8) Develop SPM business process; 10) Conduct SPM pilot and a final step – Fully deploy of SPM. (Gordon 2008, Chapter 3)

In summary, Hofmann et al. (2014), Monzka et al. (2009) and Gordon (2008) look on supplier performance evaluation from different perspectives. Hoffman et al. (2014) focus on supplier performance evaluation with regard to supplier-buyer relationships, Monzka et al. (2014) focus on supplier evaluation and selection relating to strategic sourcing, and in contrast, Gordon (2008) talks about a supplier management improving process, which focuses on a company's business process and involvement to help a supplier perform well. All sources has given significant methods and different ideas to further discover supplier performance evaluation process steps.

The following six sub-sections has been structured and divided into process steps for supplier performance evaluation taken from literature. Sub-section 4.3 describes sorting and prioritizations approaches of suppliers before evaluation, which has been considered as the first process step. Sub-section 4.4 describes second and third process steps – Establishing and Weighting Supplier Evaluation Criteria. Sub-section 4.5 describes fourth and fifth process step - Collecting and Measuring Supplier performance Data. Sub-section 4.6 describes sixth and seventh process steps - Evaluating, Reporting of Supplier Performance and Taking Corrective Actions. Sub-section 4.7 reports about significant aspects to take in consideration when setting responsibilities and deciding regularity of performance evaluation process. Sub-section 4.8 consists of the Conceptual Framework designed for this thesis project.

4.3 Filtering and Prioritizing Suppliers

For cost and resource reduction associated with the supplier evaluation, Hofmann et al. (2014), Monzka et al. (2009) and Gordon (2008) agree on filtering and prioritizing suppliers based on different methods before supplier performance evaluation. Furthermore, supplier prioritization may answer the questions as: "How often should each of the supplier groups be measured? ", and "Which of the groups asks for the special focus? " As per Gordon (2008), segmentation helps to manage supplier division, to allocate the resources and to manage and monitor suppliers.

A. Kick-Off Criteria and Entry Qualifiers

Hoffman et al. (2014) talk about Kick-Out criteria to ensure a transparent supplier performance evaluation process. Kick-Out criteria are exclusion criteria used as filters, thus suppliers that do not fulfill them are not considered for collaboration, and as well there is no need to evaluate them. As an example, Kick-Out criteria can be quality system implemented such as ISO 9001 or any other criteria significant for the purchasing organization. (Hoffman et al. 2014, p. 96). In a similar manner, Monzka et al. (2009) talks about entry qualifiers, as basic components that suppliers should pass before they are accepted as a supplier by the buyer organization and selected for the next step of evaluation. For instance, qualifiers identified must fulfill: financial strength, appropriate business strategy, strong management, proven manufacturing capability and others. (Monzka et al. 2009, p. 245)

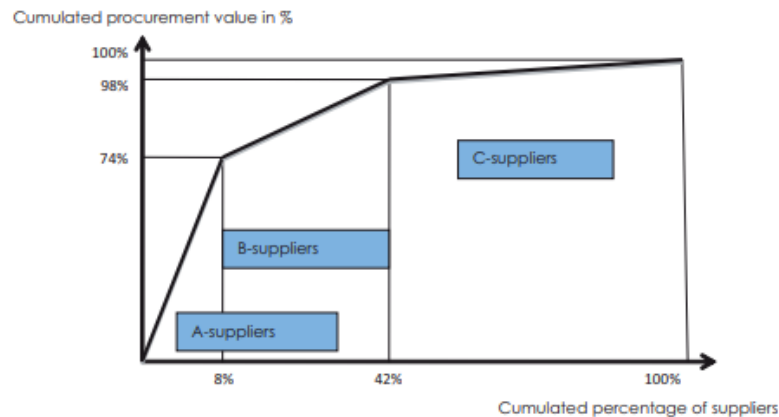
B. Supplier Prioritization Based on ABC- analysis

Another method to limit the supplier pool for the evaluation process, as per Hoffman et al. (2014), is ABC Analysis. It has been found that to evaluate in-depth only A- class suppliers is significant. For the separation of A-class or so called most important supplier group from others, ABC Analysis must be processes-based on total procurement value, total procurement quantity or any other critical factor important for the purchasing organization. According to Belmans (2012) there are six basic steps to conduct Supplier ABC analysis. These steps are: 1) Determination of success criteria; 2) Data collection on supplier based on determination criteria; 3) Sorting of supplier based on importance; 4) Calculation of accumulated impact; 5) Supplier division into classes; 6) Analysis of classes and decision based on results.

For illustration, an example presented by Hofmann et al. (2014) in Figure 7 shows ABC Analysis. In Figure 7, suppliers have been divided into classes A; B and C based on procurement value.

Figure 7. shows, that 8% of an organization's suppliers represents 74% of the procurement value, thus those suppliers are identified as A-class suppliers. 34% of suppliers represents 24% of the procurement value, thus those suppliers are identified as B-class suppliers. Further, the largest part of suppliers – 58% provide 2% of the procurement value which is the smallest percentage, therefore those suppliers are identified as C-class suppliers (Hoffman et al. 2014, p. 95-96)

Figure 7 Exemplary ABC - Analysis to determine relevant suppliers for a more detailed supplier analysis in purchasing (Hoffman et al. 2014, p. 96)

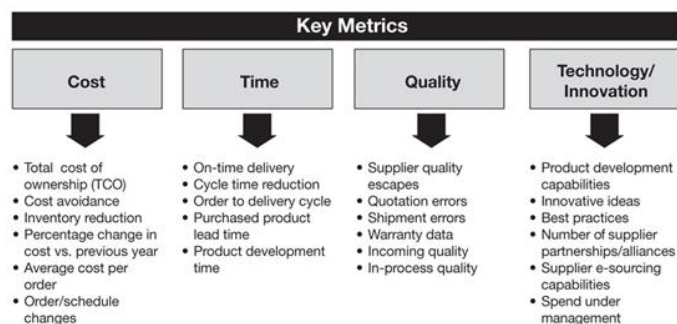


4.4 Establishing and Prioritizing the Supplier Evaluation Criteria

A. Establishment of Supplier Evaluation Criteria

The next process step of supplier evaluation is the establishment of evaluation criteria. For the unimportant suppliers, with a low purchasing volume Hoffman et al. (2014) suggests to use only one criteria, however the more complex relationships are, and the more criteria for evaluation should be selected. Additionally, the supplier performance evaluation process should start at a company level with a decision on which supplier performance criteria are important to their business. Hofmann has divided all criteria for supplier evaluation into ten main groups – Price and terms; Service; Credit rating, Information/communication performance, Innovation performance, Quality performance, Volume Performance, Environmental Performance, Logistics performance and Know-how (Appendix 6) . However, Gordon focus on Key Metric as per Figure 8.

Figure 8 Criteria of supplier evaluation (Gordon 2008, Chapter 5)



Monzka et al. (2009) on the other hand, focus on three criteria groups, which include the objective to measure supplier performance – *delivery performance*, *quality performance* and *cost reduction*. With *delivery performance* it is possible to measure, supplier ability to satisfy orders' due-date and quantity commitments based on a purchase order. *Quality performance* is a critical component measured. To measure supplier quality, purchasing can compare objectives set with an actual quality trend and with improvement rates. Cost reduction can be a common method to follow suppliers real costs based on adjustments done based on inflation, suppliers cost comparison between suppliers within same industry, target price and baseline (as example, baseline can be last price paid). (Monzka et al. 2009, p. 309)

Table 5 Qualitative Service Factors (Monzka et al. 2014, p. 310)

Qualitative Service Factors	
Factor	Description
Problem resolution ability	Supplier's attentiveness to the problem resolution
Technical ability	Suppliers manufacturing ability compared with the other industry suppliers
Ongoing progress reporting	Supplier's ongoing reporting of existing problems or recognizing and communicating a potential problem
Corrective action response	Supplier's solution and timely response on the request for corrective actions, including supplier's response on engineering change requests
Supplier cost-reduction ideas	Supplier's willingness to help finding the ways to reduce purchase costs
Supplier new-product support	Supplier's ability to help to reduce the new-product development cycle time or to help with the product design
Buyer/Seller compatibility	Subjective rating concerning how well a buying firm and supplier work together

Additionally, there are other qualitative service factors available for a buyer, which can be assessed for supplier performance according to Monzka et al. (2009) as per Table 5.

B. Weighting/ Prioritizing Supplier Evaluation Criteria

Once the criteria for supplier evaluation has been selected, as per Hoffman et al. (2014) those can be weighted / prioritize according to their relevance. A method to prioritize criteria can be based on percentage, thus the most important criteria will be given the highest percentage points (or most weighting), conversely criteria, which are not so significant gets a lower percentage value (or lowest weighting). The total sum of weighting is 100%. (Hoffman et al. 2014, p. 98)

4.5 Collecting and Measuring Supplier Performance Data

A. Sources and Information Collection for Supplier Evaluation

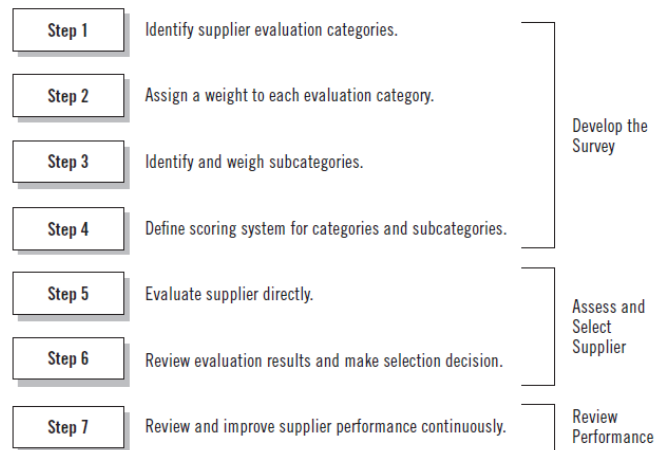
Existing suppliers can be measured using *empirical data* - documentation and analysis collected through the years of collaboration, according to Hoffmann et al. (2014), Monzka et al. (2009) and Gordon (2008). This information is stored in an information database of the purchasing organization, such as an ERP, and/or an intranet (Monzka et al. 2009, p. 239). Furthermore, as per the example, there are different options to buy a *Supplier Qualifier Report* over the Internet. D&B's database includes supplier reports relating to over the 80 million companies worldwide. (Monzka et al. 2009, p. 247).

Additionally, specific information from the supplier can be requested directly. One of the main information collection methods is a *supplier survey*. A survey consists of questions about cost structure, process technology, market share data, quality performance and other segments important for the purchase organization. As per Monzka et al. (2009) a supplier survey can be sent before the supplier measurement process, as answers can help for supplier filtering (section 4.4) as well. A well-designed survey should include important performance categories selected and a scoring system must be applied based on the meaning of each value on a reliable measurement scale (Monzka et al. 2009, p. 255). However, a supplier survey and the evaluation should be flexible, as an example weight can be adjusted for each performance categories, if needed. To design a survey based on the right characteristics required by Monzka et al. (2009), the step-by step process illustrated in Figure 9 can be applied. Furthermore, it is an option to use the survey as a performance evaluation tool. (Gordon 2008; Chapter 6)

Furthermore, information shall be collected through the *supplier visits* as per Monzka et al. (2009) and Gordon (2008). Supplier visits provide the most complete information

about a supplier, however, those are costly from the time and finance perspective. In the supplier visit, a buyer can use the checklist for the key evaluation criteria and note these during the visit. Key evaluation criteria monitored in supplier visits are – management capability, technical capability, operations and scheduling capability, financial strength and others (Monzka et al. 2014, p. 245-246).

Figure 9 Supplier Evaluation and Selection Survey Development (Monzka et al. 200, p. 256)

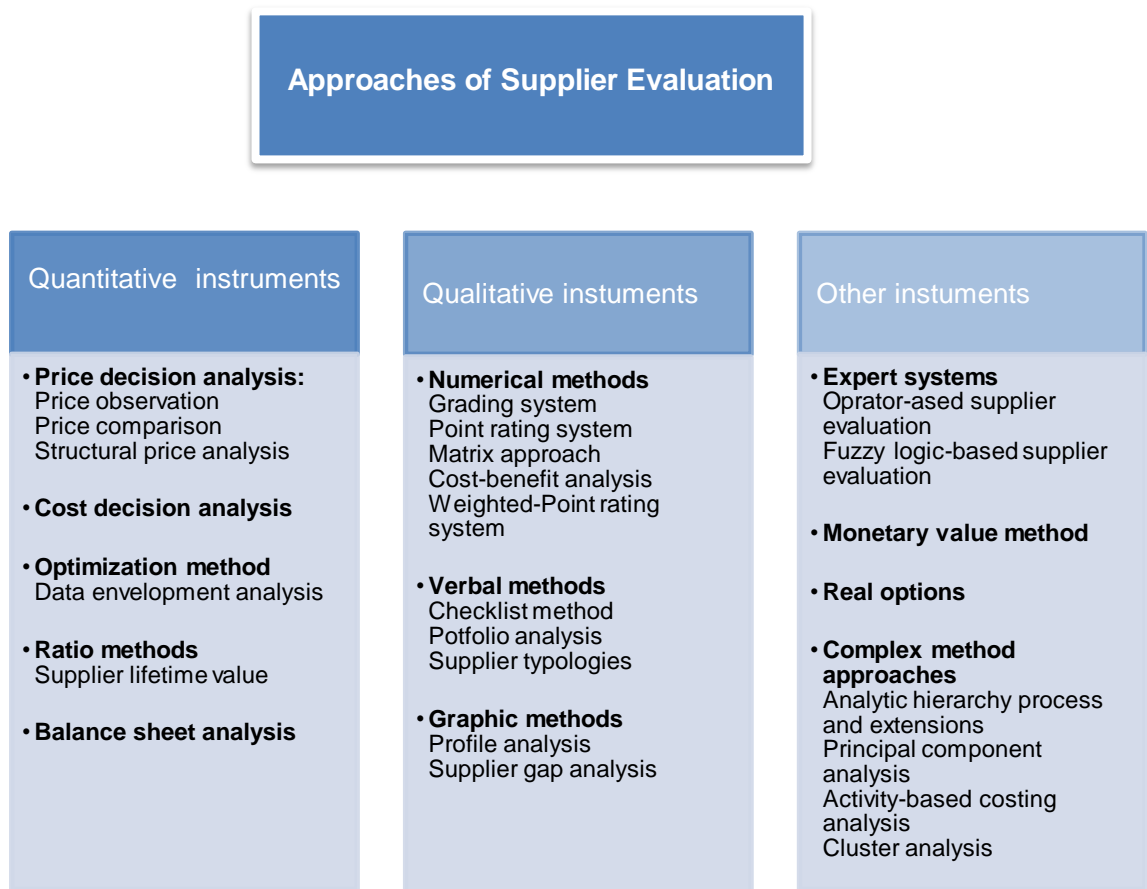


B. Measuring Supplier Performance Data

The supplier performance measuring methods can be divided into quantitative and qualitative approaches according to Hoffman et al. (2014). Quantitative methods process measurable information, which can be used in a mathematical form to measure and analyze performance. However, qualitative methods record information without precise measure as subjective assessment and different opinions collected. Additionally, there are methods that use both qualitative and quantitative information, called mixed-form approaches (Hoffman et al. 2014, p. 99). Figure 10 summarizes optional measurement methods of supplier performance data according to the manner of approach - quantitative, qualitative or mixed-form.

The following are selected different supplier evaluation approaches as per Hoffmann et al. (2014) and Monzka et al. (2008): point rating system, weighted-point system; fuzzy logic and the supplier lifetime value approach for description in-depth.

Figure 10 Overview of the methods of supplier evaluation (Hoffmann et al. 2014, p. 100); (Monzka et al. 2009, p. 312-313)



Point Rating System Method

This method is popular and used often in practice in different ways. The point rating system method can be used in: 1) the 100-points method; 2) the percentage evaluation system and 3) the scoring model. (Hoffmann et al. 2014, p. 100)

In the point rating system, evaluation is measured in awarding points, which are further added to for each solution's alternative. The method does not add any weighting or importance option for the criteria. The highest point sum formulates the best alternative. If multiple alternatives results in an equal result, further evaluation can be done. (Technische Universität Braunschweig 2016)

As per Hoffman et al. (2014), in the example illustrated in Table 6, the maximum number of points for each supplier is 100. There are 3 suppliers evaluated on 7 base criteria, and each of those obtains points based on criteria fulfillment. The sum of points in total is divided as per the rating: Excellent 95-100 points; preferable 85-95 points; suitable 70-85 points; unacceptable < 70 points. In the example, supplier 3 has collected the highest

point score – 84, supplier 2 has a score of 70 points - which is on the border between unacceptable and suitable, and supplier 1 has collect score of 63 points, which is clearly unacceptable. Regarding supplier 3, the buyer organization could work with it to improve performance or it can be eliminated from the supplier pool. (Hoffman et al. 2014, p. 101)

Table 6 Example of Supplier Performance Evaluation based on Point Rating System (Hoffmann 2014, p. 101)

Target Criteria	Max.	Supplier 1	Supplier 2	Supplier 3
Volume performance	5	4	2	4
Quality performance	25	15	20	25
Logistics performance	20	10	15	15
Remuneration performance	15	10	10	12
Service performance	15	12	5	15
Innovation performance	15	10	15	10
Environmental performance	5	2	3	3
Sum Total	100	63	70	84

This method can be processed in the percentage evaluation system and is similar in the way of processing. For the evaluation model processed by the percentage evaluation system, performance degree of criteria is defined by percent. Furthermore it is multiplied by weighting (prioritizing) specified beforehand. (Hofmann et al. 2014, p. 101)

For data analysis, there are many advantages and disadvantages to point rating methods. The point rating methods are easy to understand and simple to process, additionally they can be implemented in different business areas and segments. However, there is no weighting included in the method, therefore of importance is that all target criteria are equal and/or determined subjectively by the person, who has done the evaluation. (Hoffman et al. 2014, p. 101-102)

Weighted-Point System Method

A weighted-point system weights and calculates scores of different performance criteria. This method is an extended version of point rating method presented before, as weighing of each criteria is taken into consideration. (Monzka et al. 2009, p. 312-313)

In this method supplier score collected through evaluation of fulfillment of each performance criteria is multiplied by weighting/ importance of the each criteria. (Technische Universität Braunschweig 2016) In order to use this system, it is suggested to set performance criteria carefully. (Monzka et al. 2009, p. 312-313)

Table 6 Weighted-Point Supplier Measurement and Evaluation of David Industries for Third Quarter 2004 (Monzka et al. 2009, p. 312)

PERFORMANCE CATEGORY	WEIGHT	SCORE	WEIGHTED SCORE
Delivery			
On time	.10	4	.4
Quantity	.10	3	.3
Quality			
Inbound shipment quality	.25	4	1.0
Quality improvement	.10	4	.4
Cost Competitiveness			
Comparison with other suppliers	.15	2	.3
Cost-reduction ideas submitted	.10	3	.3
Service Factors			
Problem resolution ability	.05	4	.2
Technical ability	.05	5	.25
Corrective action response	.05	3	.15
New-product development support	.05	5	.25
Total Rating			3.55
1 = Poor, 3 = Average, 5 = Excellent			

Table 6 illustrates an example of a weighted-point rating method used in David Industries, with a scoring set as maximum rating five as per Monzka et al. (2009). This method is flexible as criteria and weights of criteria can be changed. The method is objective, reliable and can be implemented with moderate costs. (Monzka et al. (2009) p. 312-313)

Fuzzy logic Method

The fuzzy logic method can be divided into three processes: 1) *Fuzzification*; 2) *Inference*; 3) *Defuzzification*. Fuzzification is the process whereas input parameters are defined in blurry terms as *good*; *medium* and *bad* and further linked by the rule "IF-THEN" expert rule. The expert rules are defined based on buyer experiences, expectations and a company's philosophy. Defuzzification further converts the blurry results into various output values. Thus, suppliers can be sorted according to input criteria fulfillment. There

are two types of input criteria – qualitative and quantitative. Quantitative criteria are measurable and can be well presented objectively, on the other hand, qualitative criteria are mainly with a blurry manner, but because of the Fuzzy logic those can be recorded linguistically and processed by keeping qualitative character. (Hoffmann et al. (2014) p. 105)

As an example, Hoffman et al. (2014) describes supplier performance measurement based on suitability to be a Just-In Time (JIT) supplier for the buyer organization. There are three main criteria to define suitability as a JIT supplier – delivery performance, capability of supplier and supplier environment. Delivery performance is measured based on price, service/quality, due date and volume faithfulness and communication/flexibility. Capability of supply is measured based on corporate performance, financial strength and personnel. The supplier environment is measured from criteria such as general factors and task specific factors, which are not specified by Hoffman et al. (2014). Measurement on Fuzzy logic starts from the lowest level of criteria. Qualitative criteria is based on blurry terms. Thus fuzzy logic helps and uses fuzzification to transfer linguistic variables into language terms. As an example in Figure 11, linguistic variable "geographic location. Geographic location is set as *good*, if the distance from supplier to buyer is not more than 100 k; *medium* if distance is between 116 and 133 k and *bad* if distance is longer than 150 k.

The demonstration of criteria is displayed based on fuzzy vectors in the form:

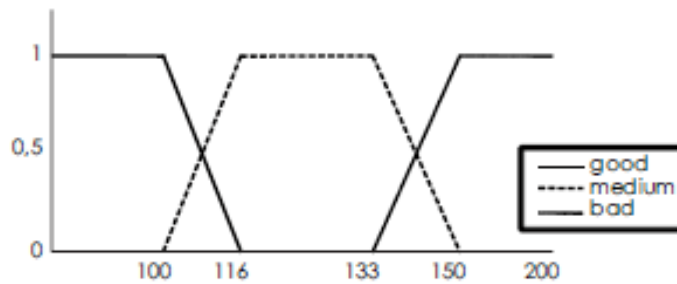
$$\mu_{GL}(x) = [\mu_{GL}(x)_{good}, \mu_{GL}(x)_{medium}, \mu_{GL}(x)_{bad}]$$

(Hoffman et al. 2014, p. 107-108)

Thus, as per the example:

$$\mu_{GL}(120) = (0; 1.0) \text{ or } \mu_{GL}(108) = (0.5; 0.5; 0)$$

Figure 11 Linguistic variable "geographic location" with the membership function of supplier evaluation within the scope of fuzzy logic (Hoffman et al. 2014, p. 106)



Road connection is calculated in a similar manner. Table 7 shows block of rules for two criteria – Geographical location and Road connection in a scope of fuzzy logic. Both criteria defines business location in this particular example. (Hoffman et al. 2014, p. 107-108)

Table 7 Block of rules for evaluating a business location within the scope of fuzzy logic. (Hoffman et al. 2014, p. 107-108)

Rule	PREMISES		CONCLUSION
	IF	AND	THEN
	Geo.Location(GL)	Road conn. (SA)	Location
1	good	good	good
2	good	medium	good
3	good	bad	medium
4	medium	good	good
5	medium	medium	medium
6	medium	bad	medium
7	bad	good	medium
8	bad	medium	medium
9	bad	bad	bad

Fuzzy logic is a tool that can be used well to record linguistic "measures" of qualitative criteria, therefore qualitative and quantitative measures can be combined into supplier evaluation process. However, due to the method's complexity, it is significant to involve information technologies for development and processing. The method is able to evaluate a supplier based on a large number of criteria and sub-criteria, furthermore, human subjectivity in results is prevented, as criteria cannot be change manually. Although subjectivity is reduced, personal preferences are still available in fuzzy logic.

The method overall is complex, therefore it is hard to understand, for training and practice. (Hoffman et al. (2014), p. 107)

Supplier Lifetime Value Method

Supplier Lifetime Value (SLV) method is an approach oriented for the future supplier evaluation to determine medium and long-term supplier potential. The method is based on classic investment calculations to determine supplier's *cash value*. (Hoffman et al. 2014, p. 110-111)

For the method, SLV is calculated as per the formula:

$$SLV = \sum_{t=0}^T \frac{e_t - a_t}{(1+i)^t}$$

where

SLV	Supplier lifetime value
e_t	supplier-specific inpayments in period t
a_t	supplier-specific outpayments in period t
t	Period
T	Total number of periods considered
i	Discounting rate

(Hoffman et al. 2014, p. 111)

The strength of the SLV method is the future orientation by taking in to account supplier's development options. Furthermore, as the supplier is considered an object of investment, strategic supplier management can be applied. However, data such as future in payment out payment flows and discount rates used for evaluation are hard to determine. To select a perfect method for supplier evaluation, a buyer organization has to determine outcome expectations, as each of the methods mentioned have their own features, however SLV exceptionally from others is future oriented. Fuzzy logic can be suitable, when many qualitative criteria is considered as part of the process. (Hoffman et al. 2014, p. 111)

When a suitable method of supplier measurement is selected and the evaluation done, the next step is to report results and to take corrective actions to improve supplier performance, if needed.

4.6 Review Results of Supplier Evaluation and Taking Corrective Actions

Most organizations set three primary criteria 1) cost of price; 2) quality and 3) delivery, when a supplier is analyzed. The criteria mentioned are the most critical ones that affect purchaser and organization, thus in-depth analysis of a supplier's capabilities is significant. *Management capability; employee capability; cost structure; total quality performance, systems and philosophy; process and technological capability; environmental regulation compliance; financial stability; production scheduling and control systems; e-commerce capability, supplier's sourcing strategies, policies and techniques; long term relationship potential* are eleven segments of criteria that can be considered to be measured in-depth. (Monzka et al. 2009, p. 256) When results of measurement have been collected, the purchaser should compare these with a set performance minimum to be acceptable with regard to the requirements. (Monzka et al. 2009, p. 256)

For supplier performance data collection, supplier performance scorecards are the most common method tool. Scorecards can gather quantitative information, thus it is a good tool for decision making. The largest benefit is the option to view supplier performance and to manage it, moreover, it helps to organize supplied data and is handy for usage. (Gordon 2008; Chapter 6). Further, all results should be reviewed and a decision must be made - is the performance is acceptable, unacceptable and what corrective action will be applied? (Monzka et al. 2009, p. 259) Furthermore, all system should be overviewed to see any need for changes and adjustments. (Hoffman et al. 2014, p. 173)

Although, there can be many different methods used to collect performance information, there should be one formal way to inform the supplier regularly about their performance and plan a time for discussion. To improve supplier performance, it is significant to present KPIs and the final scorecard to them. The one option is information available from the *supplier portal*, where the scorecard can be seen on demand, or it can be sent *electronically*. Furthermore, *supplier performance* or *business review meetings* can be organized for key, strategic and critical suppliers. A business review meeting includes information sharing from the buyer and supplier sides regarding significant business

priorities, technology trends and business opportunities and others. (Gordon 2008, Chapter 7)

4.7 Responsibilities and Regularity of the Supplier Performance Evaluation

A. Organization's Areas Responsible for Supplier Evaluation

For the process being organized in a good manner and for the balanced supplier evaluation, it is significant to involve as many corporate areas as possible. Different corporate areas can participate in decisions regarding performance criteria selected for supplier evaluation and in criteria being evaluated, as per Hofmann et al. (2014). According to Hoffman et al. (2014), a supplier performance evaluation process shall be distributed to areas that specialize and are affected with criteria evaluated, therefore:

"...quality department evaluates product quality, the quality system and quality awareness, the R&D department evaluates innovativeness as well as development potential and performance, and purchasing evaluates the supplier's price and cost discipline, communication and flexibility.

(Hofmann et al. 2014, p. 97-98)

B. Measurement and Reporting Regularity

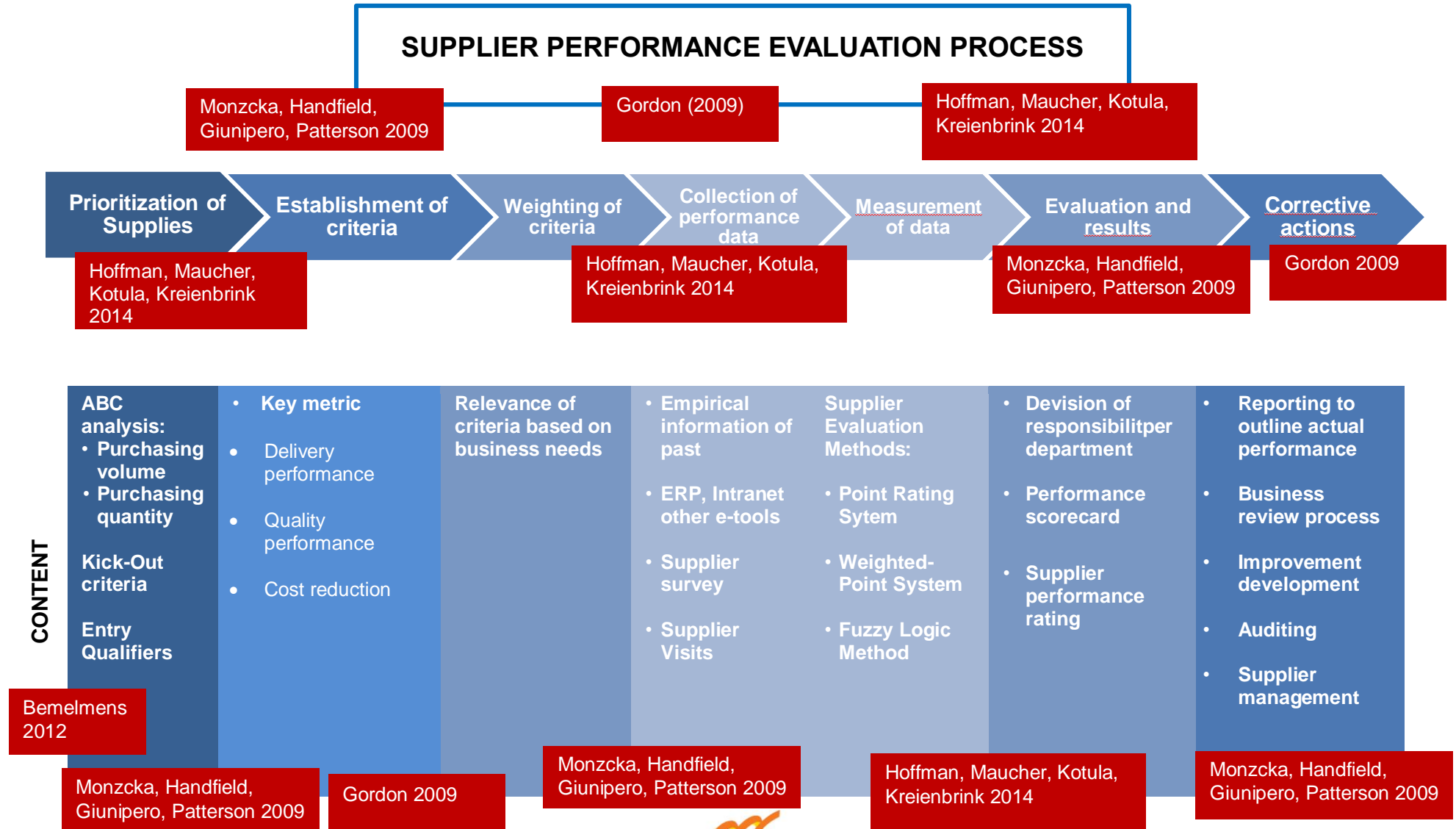
There are two open questions relating to frequency to report supplier performance – buyer reporting frequency and supplier reporting frequency. A person or department responsible for the daily supplier management must receive daily report, where all the previous day's activities are summarized. It would let the buyer observe incoming orders and goods and to compare this with past activities. Furthermore, a buyer should receive reports of supplier performance on weekly, monthly, quarterly and yearly bases. (Monzka et al. 2009, p. 311) Both, Gordon (2008) and Monzka et al. (2009) agree, that as per routine supplier performance, as the best this should be processed monthly or quarterly, with following supplier-buyer meetings once a year to analyze performance results and to discuss improvement options. However, if poor performance has been recognized, reporting to supplier and corrective action must take place immediately to prevent financial and operational influence. (Monzka et al. 2009, p. 311)

4.8 The Conceptual Framework of the Thesis Project

The conceptual framework consists of the main information of process steps based on literature from Monzka et al. (2009), Gordon (2008) and Hoffman et al. (2014), which has been used as main sources for process development in the framework stage. This framework concentrates on supplier performance evaluation only.

Mostly, for all process steps three base sources has been used, as seen in the framework illustration. The sources use focus on supplier performance evaluation processing, but each of these look at the process from different perspectives.

Figure 12 The Conceptual Framework of this study



5 Developed Supplier Performance Evaluation Process

This section discusses the result of the current state analysis and conceptual framework and the supplier performance evaluation process proposed to the case organization.

5.1 Developed Supplier Performance Evaluation Process

The objective of this thesis project is to develop a supplier performance evaluation process. The process will be described in the following seven process steps that are included in the developed supplier performance evaluation. The process has been developed based on the knowledge gained from the current state analysis and best practices taken from literature, divided into four sub-sections. First, process step 1 – Conducting the supplier prioritization, second, process steps 2 and 3 – Establishing and weighting supplier performance evaluation criteria, third, process steps 4 and 5 – Collecting and measuring supplier performance data, fourth, process steps 6 and 7 – Consolidating, reporting supplier performance results and taking corrective actions.

For the thesis objective fulfillment, the supplier performance evaluation process should be developed for the case organization. The main aim is to evaluate existing supplier performance based on the case organization's performance criteria. Furthermore, the aim of the supplier performance process is to improve organization performance, like per literature reviewed, in addition to the company's internal performance factors, overall organization's performance depends on the suppliers' performance (Hoffman et al. 2014). The supplier performance evaluation process can decrease the risk of the overall purchases made by the organization, furthermore purchasing can be more effective.

As is seen from the current state analysis, actual supplier performance approaches used in the organization are not standardized and compliant when comparing with the best practices and approaches taken from the literature. Thus, the process is developed as new, by taking in to consideration weaknesses and strengths of the case organization.

For proposal building, purchasers and management were involved. Second, a management workshop (Appendix 7) was organized to present the current state analysis and process steps designed from the literature (Figure 12). Management

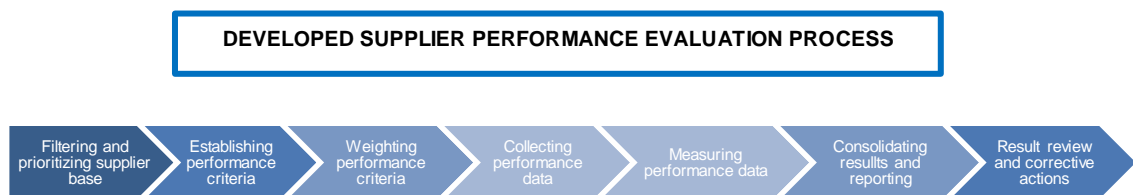
accepted the process steps and mentioned that those are logical and applied to the organization's routine. Furthermore, as some of the supplier performance evaluation concepts are designed by taking in to consideration the organization's business strategy, it was discussed with management. However, after discussion, a decision was made that process should be as simple as possible at first, because of the short period of time for development, and additionally it would ensure simple implementation and training. However, in the future, the process can be changed by involving more complex ideas behind it. In the second part of the workshop, performance criteria and weighting were discussed and set, as it is a management decision as to what performance criteria to focus. Additionally, the overall project process into organization and planning were discusses. Because in the company within the short time prior the workshop there was a change in the manpower in the purchasing department, for the supplier performance evaluation process development project, two purchasers were only involved for the second interview.

Two purchasers were interview (Appendix 8). Interviews started with a presentation of the current state analysis and by discussing the process built from the best practices, described in the conceptual framework. Purchasers expressed their opinion on process stages and suggested how each of the steps could be processes from their point of view. Further, ideas for each process step taken from literature were presented and discussed, which of each option would be the best and why. First purchasers had a knowledge and ideas framework, and after the discussion the developed process were summarized. The purchaser suggested that: 1) supplier performance evaluation process should be done by separate department, which would focus on performance evaluation. As a reason of this, the purchaser mentioned that at the moment daily routine is fulfilled with many processes, thus another new process would increase work load and the possibility that it would not be done in high quality. However, corrective action and communication would be managed by purchasers responsible for the problematic suppliers. 2) The purchaser suggested from the options to measure supplier performance to use a Weighted-Point Rating system, as it was clear in the process and it could be managed by actual tools that are available. Second purchasers were not familiar in depth with the concepts discussed in the framework, however, mentioned that process steps overall are well planned and logical. With regards suggestions, it was important for the second purchaser that well planned training would be available, to receive knowledge about ideas and tools implemented into the supplier performance evaluation process.

The supplier performance evaluation process has been developed based on framework process steps, as this was the approach from stakeholders and has been taken from the best practices overall. The proposed process and each process step has been designed based on management expectations, best practices from literature and purchaser interviews.

The proposed process is described step by step including tools and approaches used for each of these, as per Figure 13.

Figure 13 Co-Developed Supplier Performance Evaluation Process steps



Further, seven process steps are divided into four sub-sections. Sub-section 5.2 Process step 1u -Conducting Supplier Prioritization; sub-section 5.3 Process step 2 and 3 – Establishing and Weighing Supplier Performance Evaluation criteria; sub-section 5.4 Process step 4 and 5 – Collecting and Measuring Supplier Performance Data; sub-section 5.5. Process steps 6 and 7 – Consolidating and Reporting Supplier Performance Results, Taking Corrective Actions.

5.2 Process Step 1 – Filtering and Prioritizing Supplier Base

The supplier performance evaluation process requires resources such as unpredictable costs, time and manpower. To limit time and costs associated with supplier performance evaluation, suppliers should be filtered and prioritized. In this project framework different tools were presented to filter and to prioritize the supplier base, however supplier filtering based on Kick-out criteria (Hoffman et al. 2014) are compliant for the organization's needs because - simplicity and technical support available, as well as supplier prioritization by ABC - Analysis tool proposed in framework by Hoffman et al. (2014) and Monzka et al. (2009).

Filtering Suppliers by Kick-Out Criteria

The thesis project framework presented Kick-out criteria as exclusion criteria for filtering suppliers based on requests important for the organization, as per Hoffman et al. (2014). The case organization is a sales driven company, thus customer requests has been stated as the most important by the management. Therefore, customer expectations collected in current state analysis as: 1) fast delivery, 2) reliability of delivery and 3) quality has been taken as the main guideline to selection Kick-out criteria. The first Kick-out criteria set is the option to use *express service* ensured by the supplier/ or ordered by the organization's forwarding department. The option as express delivery will provide fast delivery to a customer if necessary, as well as reliability of delivery, as the express delivery service ensures full time tracking, fast service, and it can prevent late order delivery in stock-out situations. As a second Kick-out criteria, certification by *quality standard ISO 9001* is proposed. By doing business with ISO 9001 certified suppliers only, the case organization can determine that suppliers business processes, communication and responsibilities are comprehensive, therefore there is less risk of late and unreliable deliveries, quality non-compliances and other unacceptable bottlenecks in the operational processes.

Information regards a supplier's availability to ensure express service and certification of ISO 9001 can be found in the case organization's intranet system, where information on existing suppliers are stored. However, if the information is missing, a simple e-mail can be sent.

After supplier filtration by Kick-out criteria is set: 1) available express delivery service, and 2) valid certification by quality standard ISO 9001, suppliers, which has been qualified, are prioritized by an ABC Analysis tool.

Prioritizing Suppliers by ABC Analysis Tool

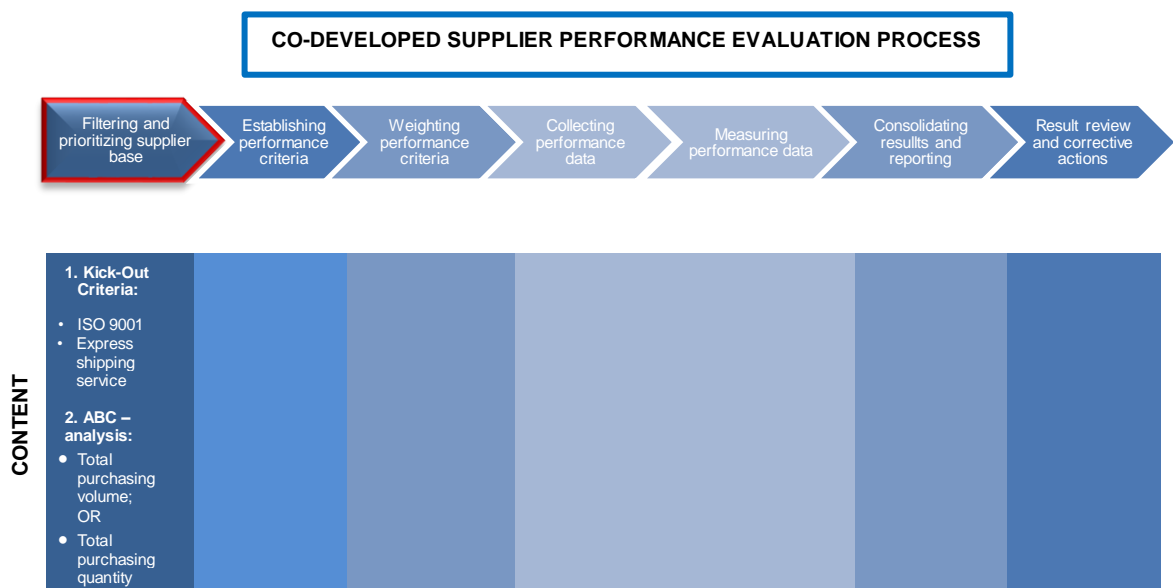
The thesis project framework proposes to prioritize suppliers before performance measurement to save resources and to help the organization to understand the focus groups based on requirements and business needs, as per Hoffman et al. (2014), Monzka et al. (2009) and Gordon (2008). Moreover, Gordon (2008) tells that supplier division helps to allocate an organization's resources to manage and monitor suppliers.

The proposed ABC- analysis process is based on Belmans (2012) from the thesis framework.

The proposed process includes six basic steps: 1) Determination of success criteria – total purchasing volume, or total purchasing quantity; 2) Data collection from SAP analysis tool based on selected criteria; 3) Sorting of supplier based on importance; 4) Calculation of accumulated impact; 5) Supplier division into classes – A;B and C; 6) Analysis of classes and decisions made with regards to selection for the further supplier performance measurement process.

The framework purpose is to measure A class supplier performance in-depth comparing with other groups, as those are strategically important for the organization’s business (Hoffman et al. 2014). However, as the case organization has huge variety of products purchased from almost 400 suppliers, the proposal involves a process to measure A; B and C class suppliers within the same manner and process. Instead, the difference comes by the frequency of suppliers measured and evaluated. The proposal sets that A class suppliers are measured once a month; B class suppliers measured twice a year, and C class suppliers are measured one time per year. The supplier division in to groups can be changed, as it is based on a prioritization criteria selected, which depends on the evaluation focus. For illustration, Figure 14 presents tools included in the first process step.

Figure 14 Process step 1 illustrated in the supplier performance evaluation process



In process step 2 in the proposal, evaluation process establishment of performance criteria has been set, process step 3 covers weighting of performance criteria.

5.3 Process Steps 2 and 3 – Establishing and Weighing Supplier Performance Evaluation Criteria

The supplier performance evaluation process consists of many steps as described before. Furthermore, to process supplier performance evaluation process successfully, the base component is performance criteria set for the measurement and evaluation. The framework presents, as per Hoffman et al. (2014), supplier performance evaluation's active process starts with management level decision of performance criteria selected for the supplier evaluation process. Supplier performance evaluation criteria should be important for the organization's business, and criteria weighted according to importance of each of those.

Establishing Supplier Performance Criteria

Supplier performance evaluation criteria is established as the base component for the supplier performance evaluation process proposal based on the case organization's needs. As per Hoffman et al. (2014) the key metrics for supplier evaluation presented in the framework are - cost, time, quality, technology and innovation (Figure 8; Hoffman et al. (2014), p. 98), on the other hand, Monzka et al. (2009) focuses on three main criteria groups – delivery performance, quality performance and cost reduction (Monzka et al. (2009), p. 309), additionally, criteria must be important for the case organization. Criteria for supplier evaluation are established as per management performance priorities for the case organization presented in the current state analysis: 1) *Delivery performance (lead time, order reliability)* 2) *Quality performance*, 3) *Price*, and 4) *Statement based criteria - Trust, Loyalty and Collaboration*; these coincide with Monzka and Hoffman statements as well.

Delivery performance is an important aspect for the case organization. Customers have mentioned specifically - short lead time, as per interview, as the most significant condition, which they expect from the case organization. However, in the management workshop it was considered, that the most important for the organization is certainty – the lead time given by supplier is reliable. The purchasing department do have tools and

skills for article planning, thus if purchasers do have the correct information from the supplier, demand and supply can be planned successfully to fulfill customer's needs. Furthermore, supplier ability to meet quantity commitments of a purchase order is an important aspect for supply planning and critical for the case organization.

Quality performance is a critical criteria for the case organization's management and customers, moreover it has been a significant aspect of case organization's brand. The case organization follows the quality trend currently in their intranet, where claims have been counted. However, for the supplier performance evaluation process it is proposed to filter reclamations opened for suppliers, based on specific type. Type would help to detect supplier bottlenecks and to create corrective actions to prevent those.

Price and terms of products are import in every business. As per the current state analysis, it is important for the case organization's customers and management. The main guidelines for price objective in the proposal is the lowest possible price offered by supplier compared to others. Furthermore, price stability, the organization's offered price terms and suggested supplier cost reduction ideas are significant.

Statement based criteria - trust, loyalty, and sustainability are not measurable ratios, therefore those can be included as criteria based on statements, when evaluating supplier's business practices, certificates and other information given by suppliers. There are signs, which allows to detect relationships and service based on these aspects. The criteria mentioned are important to establish long lasting relationships with suppliers, because suppliers selected on skills only results in frustration, wasted time and a need to change supplier because of cultural incompatibility, as per Vitasek (2018). Furthermore, Vitasek (2018) cites Manrodt and Lelow on their Compatibility and Trust assessment developed, where trust is defined as:

"Performance to promise and meeting commitments is the foundation of trust. Without performance, trust cannot exist."

(As cited in Vitasek, 2018, Forbes)

Therefore, meeting commitments, fulfilling promises agreed and collaboration proposals has been set as guidelines for suppliers to have excellent performance in proposal process. A supplier must show capability to fulfill commitments and promises given,

process collaboration based on good relationship principles and show loyalty as being a long term supplier, using the case organizations payment terms, join into collaborative projects. Additionally, as for the case organization it is significant to do business with companies that do have sustainability ideas implemented into business operations, therefore it is proposed to take sustainability criteria in to consideration, when suppliers are evaluated. All of these aspects must be practiced from both the supplier and buyer sides.

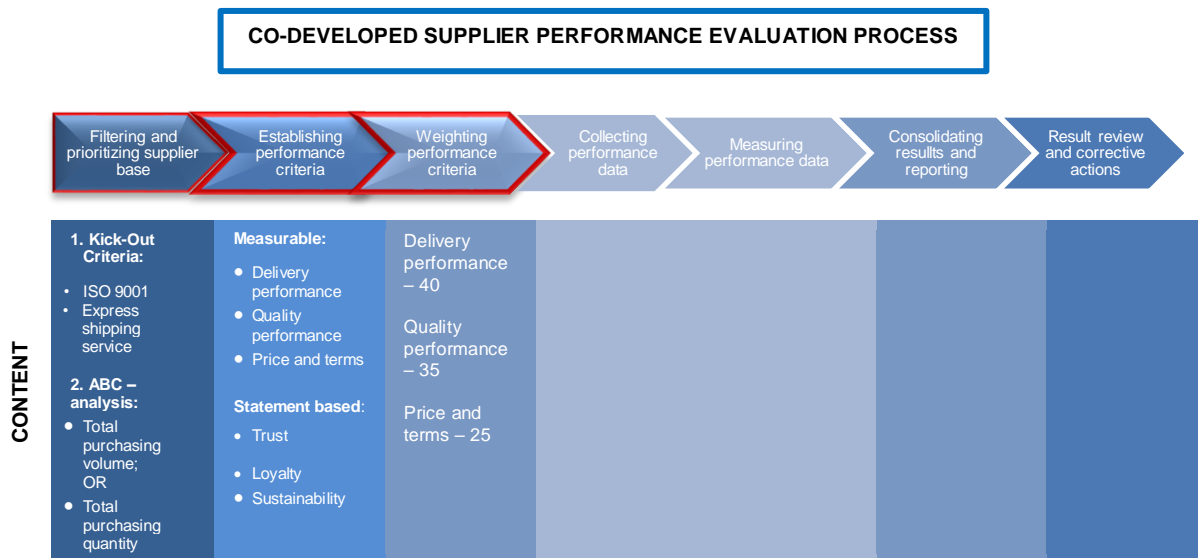
Weighting Supplier Performance Criteria

The thesis project framework suggests to prioritize supplier performance evaluation criteria based on the relevance to the organization's business needs, according Hoffman et al. (2014). The criteria in the proposal have been established in a numeric manner, based on importance as per information from the current state analysis and from the management decision in the workshop, when the proposal was discussed. Performance criteria for the proposal are weighted accordingly based on the importance: Delivery performance - 40; Quality performance - 35; price and terms – 25. Delivery performance in the supplier performance evaluation process are based on measures for: 1) correct forwarder used when purchase order is sent; 2) order lines delivered on time; 3) correct order quantity ordered. Quality performance is measured by the number of claims according to purchase rows ordered. Price and terms measures are based on performance with regards to: 1) correct price used in purchase order confirmation; 2) correct invoice details; 3) cheapest price comparing other suppliers.

Additionally, statement based criteria each can give 10 points in total 30 points as an addition to the supplier performance final result.

In summary, Figure 15 illustrates the proposed process steps of the supplier performance evaluation process in detail. When performance criteria of supplier evaluation are developed and weighted, process steps as performance data collection and data measurement follows.

Figure 15 Process steps 2 and 3 in supplier performance evaluation process



5.4 Process Steps 4 and 5 – Collecting and Measuring Supplier Performance Data

Collecting information for the supplier evaluation is significant in the proposed process, as it gives the bottom of knowledge with regards to suppliers and their performance and the tactility of the evaluation process. Accordingly, measuring supplier data is an important process step, as it transforms many different data collected to one supplier performance result. The supplier performance result gives a clear image about supplier conformity to the organization’s purchase requirements.

Collecting Supplier Performance Data

The framework of thesis suggests different sources of supplier performance data collection such as documentation and analysis collected through the years of collaboration, in accordance with Hoffmann et al. (2014), Monzka et al. (2009) and Gordon (2008). Information can be stored in the organization’s ERP, intranet and other data collection tools, therefore data volume can differ based on the business organization’s capabilities. (Hoffman et al. 2014, p. 239).

In the development of this process, the current state analysis data was taken into the consideration. The current state analysis detected the case organization’s strengths as

– the organization does have various IT tools for data collection available, technical support and resources for tool development. Additionally, the management expects the process to be developed based on simplicity, flexibility and data traceability. To fulfill the management's expectations and by using the organization's technical strength, all data collection is IT based, except particular needs such as supplier visits and others. The main tools for data collection are proposed to be the case organization's ERP tool, which records all empirical data with regards to delivery performance as an ability to meet order due-date and quantity ordered based on purchaser order. As a second tool use of the Intranet system is proposed, which already holds supplier cards with details such as number of reclamations, number of quotations and other important data. As a third data collection instrument, supplier surveys is suggested.

The ERP tools is proposed to be used to collect performance data regarding the most important set criteria - *delivery performance*. Delivery performance criteria is fulfilled if agreed forwarder is used, order lines are delivered on time and the correct quantity is ordered. The ERP analysis tool ensures reports with information regarding delivery performance of order lines and order quantity. To receive clear data for measurement, manipulations in excel must be applied. For development, it is significant to design reports, which would collect information on forwarder used for each delivery and compare it with purchase order information.

For collection of *quality performance* data, the intranet is the main tool selected. Claims are reported and handled in the intranet therefore it is the appropriate tool for quality measurement and observation.

For collection of data with regards to supplier price and terms, the ERP system can be used as it includes a financial reporting tool. However, at the moment there is no special report developed, which would allow price differences and invoice details to be seen, therefore manual work must be done.

For information collections relating to *statement based criteria such as trust, loyalty and sustainability*, a supplier survey must be used. The supplier survey must include information requests, certification, company's development plans, sustainability projects and others.

Measuring Supplier Performance Data

The thesis project framework presents various methods to measure supplier performance data. Each of these have their own pros and cons, when compared and analyzed to select the most appropriate method for the case organization. By taking in consideration information collected in the current state analysis as employee practice and knowledge and management expectations such as traceability, a simple and flexible process requirement, as the most appropriate performance measuring methods – a weighted-point rating method was selected. Additionally, both purchasers who were interviewed in the proposal building stage chose the same method, when it was discussed.

The weighted-point rating method is simple and easy for understanding and training with traceable data. It is cheap to implement and does not require large investment for processing. Moreover, the method measures and calculates supplier performance from different criteria and taking each criteria weighting into consideration for result as per Monzka et al. (2008) in the thesis framework. As performance categories for measurement, delivery performance, quality performance and price and terms performance are set. A weight for each performance categories is accordingly: 40; 35 and 25. Illustrated weighted-point rating method for measurement proposed according the criteria and weight in the supplier performance evaluation process is presented in table 5. Table 5 has been designed by taking ideas described in the thesis framework regards method's development and practice suggested by Monzka et al. (2008).

According to Table 8 and the manner of method, performance criteria is divided in sub-criteria and weight is divided accordingly. The supplier score is calculated based on fulfilment of each performance category, as per the formula:

$$\text{Performance category fulfillment} = (\text{number of accepted actions} / \text{total number of actions}) \times \text{weight of criteria}$$

As an example, on time delivery, if a supplier has had 2 delayed deliveries and total number of deliveries per performance is 10:

$$\text{On time delivery} = (8/10) \times 20 = 16$$

Accordingly, if a supplier has excellent fulfillment in each of the performance categories measured, the total score is 100. Accordingly, 10 points is set as very poor performance, 50 points – unsatisfactory, 70 points – average, and 100 points – excellent.

Table 8 Weighted-point rating method according to criteria and weight set for supplier performance measurement in proposed supplier performance evaluation process. Supplier scorecard.

<i>Performance category</i>	Weight	Score	Weighted score (weight x score)
<i>Delivery performance</i>	40		
<i>On time delivery</i>	20		
<i>Quantity precisely</i>	20		
<i>Quality performance</i>	35		
<i>Inbound shipment quality</i>	35		
<i>Price and terms performance</i>	25		
<i>Best price</i>	10		
<i>Organization's payment term</i>	5		
<i>Cost-reduction ideas</i>	5		
<i>Correct invoices</i>	5		
Total	100		

Weighted score rating:

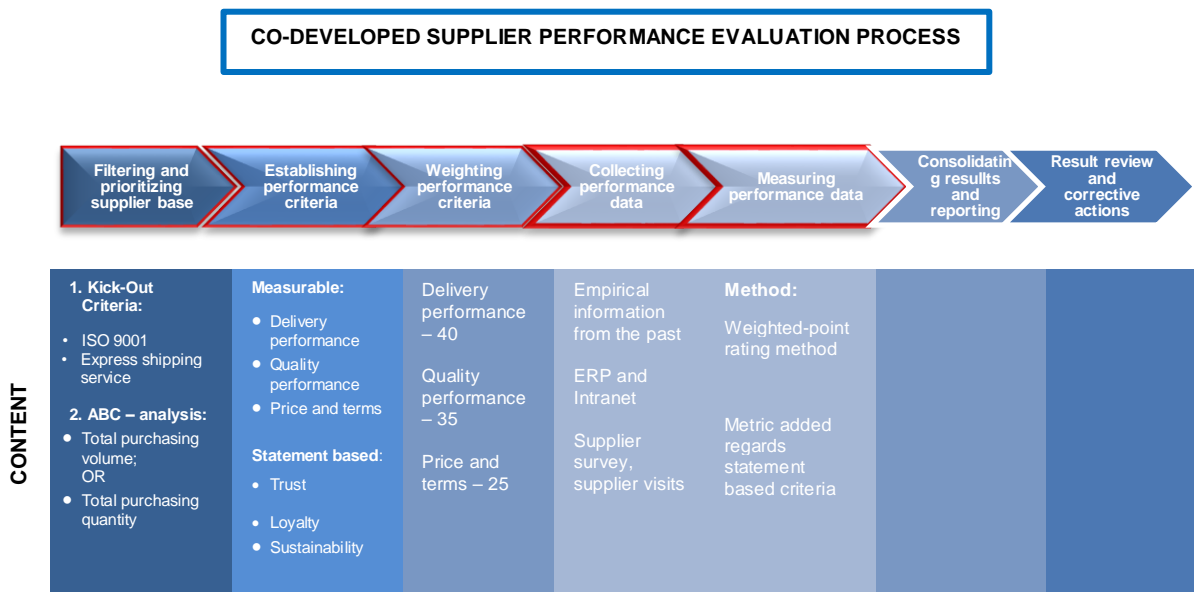
- 10 – Very poor**
- 50 – Unsatisfactory**
- 70 – Acceptable**
- 100 – Excellent**

For application of statement based criteria in the total weighted score of supplier performance, each of three statements - *trust*, *loyalty* and *sustainability* is evaluated based on supplier survey answers and other information collected. Accordingly, per one criteria fulfilled, the supplier can receive 10 points. However, if the criteria is not fulfilled -10 points (negative) are applied to the final score. As an example, if a supplier receives 100 point score for delivery, quality and price and performance criteria, but not one of statement based criteria, the supplier final score is 70 points.

The measurement technique proposed ensures flexibility, therefore performance categories weight and themes can be changed based on the organization’s business needs and depending on the supplier base.

In summary, the progress of process by adding steps 5 and 6 is illustrated in Figure 16. As per the detail, the main data performance collection tools are - empirical information, the ERP and Intranet system, supplier survey and supplier visits.

Figure 16 Process steps 4 and 5 in proposed supplier performance evaluation process



After conducting the supplier performance measurement step and the supplier score is received, all information should be consolidated, reviewed, shared with purchasers and corrective action must be considered if performance is inappropriate.

5.5 Process Steps 6 and 7 – Consolidating and Reporting Supplier Performance Results, Taking Corrective Actions

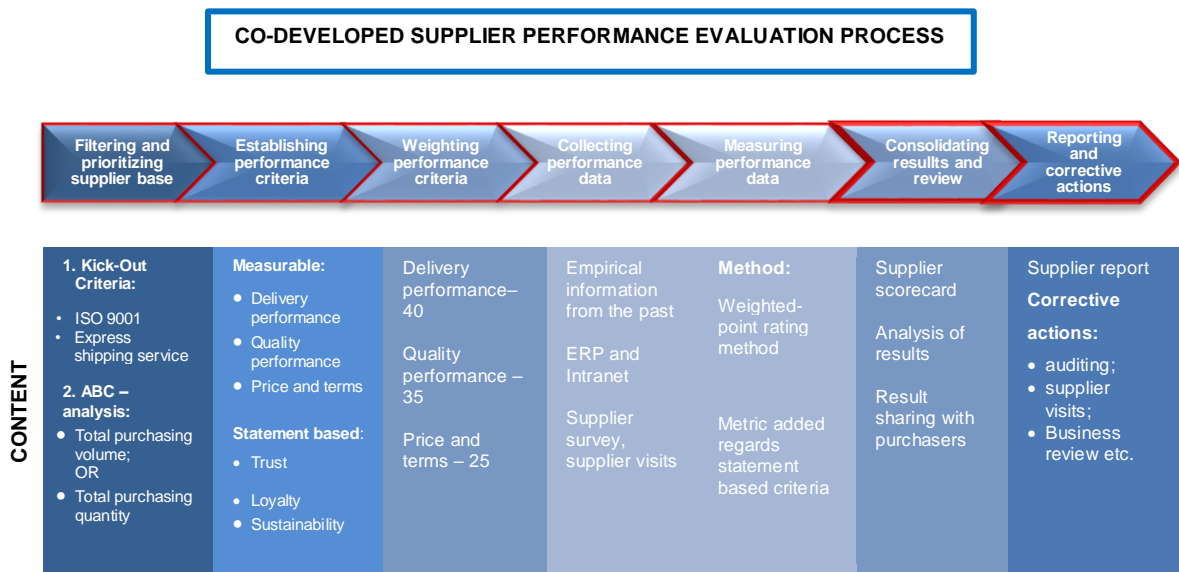
Supplier performance results are important as these present suppliers’ capability to fulfill performance criteria important for the organization. Therefore data must be analyzed in-depth, by taking in to consideration the performance minimum, and by comparing it with supplier performance results. Furthermore, results should be shared within the company and with supplier, additionally corrective action may be applied depending on

performance result (Monzka et al. 2014, p. 256-259). As per the knowledge gained from the thesis framework, the supplier scorecard has been designed and presented in table 5. The supplier scorecard is the main tool to collect supplier performance data in the measurement process. Further, supplier performance results are handled and compared with rating to answer the question: "Is the particular supplier's performance acceptable?". If performance is acceptable (starting from 70 points), the supplier must be informed about it, furthermore, it is suggested to add some tips to help the supplier improve their performance. It is significant also, if the supplier result is slightly lower than 100 points. Tips can consist of deeper explanation of why 100 points are not received, and what are the categories, where a lack of performance has been noticed. However, if the supplier performance result is unacceptable, corrective action must be applied. Performance results must be sent to the customer and poor performance areas must be highlighted. Moreover, the supplier must be informed about corrective action applied and deadline of those as well as following the planned process. Proposed corrective actions to improve performance are – auditing the supplier company's department responsible for criteria, supplier meeting (to discuss criteria, reasons of poor performance, consequences and preventive actions), business review process, repeated supplier performance measurement after every 2 weeks, and others. Additionally, the case organization must review their own operations – purchasing schedules, lead times, inadequate requests and other, to make sure that the reason for the low supplier performance score has not been caused by the organization's own actions.

In the proposal, the supplier has 6-12 months to improve performance and fulfill corrective action, however, if there are no results, a supplier change process must be started, depending on options available.

In summary, the progress of process by adding steps 7 and 8 is illustrated in the Figure 17. As per detail, within step 7 the supplier performance result is collected on the supplier scorecard and analyzed comparing actual score with valuation criteria and further shared through the company. In process step 7, suppliers are informed about their performance score, and corrective actions are applied, if necessary.

Figure 17 Process steps 6 and 7 in proposed supplier performance evaluation process



5.6 Functional Requirements

Responsibilities in the Process

According to the thesis project framework, there are different options to divide responsibilities across the organization to evaluate supplier performance. As per Hoffman et al. (2014), responsibility to evaluate special criteria can be based on specialization. The process proposed is based on three criteria groups – delivery performance, quality performance and price and terms performance. In the case organization all these three groups are under the responsibility of the purchasing department, therefore persons responsible are purchasers. However, as per feedback from the purchasers interviewed in the co-development stage, they have enough responsibilities already and it causes the risk that the process will be not processed in detail and quality. Additionally, as per the current state analysis, currently there is a lack of knowledge regarding supplier performance evaluation in the purchasing department, thus it would take time to train the department properly. By taking in consideration the aspects described, it is proposed to hire a performance engineer/manager who would be responsible for the supplier performance evaluation process. Purchasers would be involved in the process in step 6, after analysis of performance results. Purchasers are planned to be responsible with regard

to communication with supplier and would work together with the performance engineer to increase supplier performance.

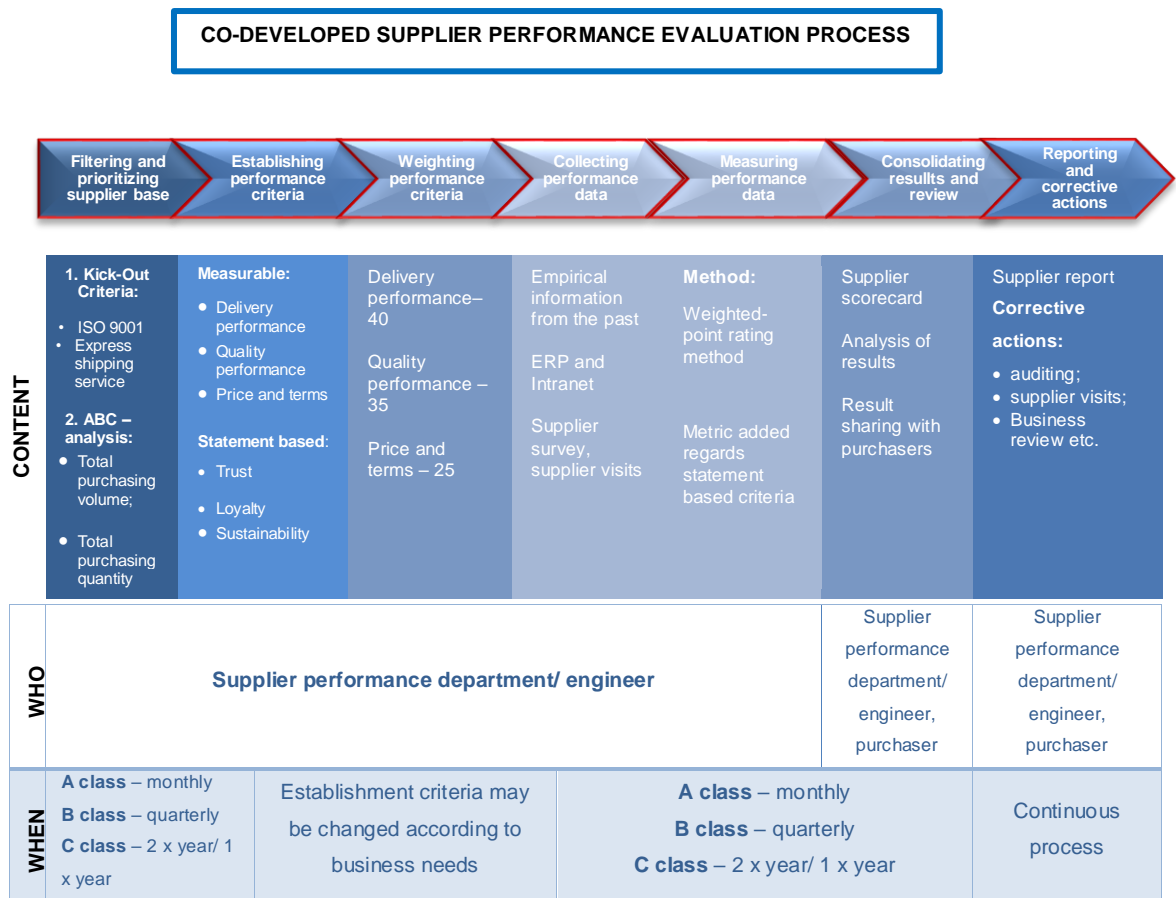
Evaluation and Reporting Frequency

The thesis framework, in accord with to Gordon (2008), mentions that it is necessary to evaluate supplier performance as often as possible, however Monzka et al. (2009) look at this topic in two ways – how often buyers should be informed about supplier performance, and how often suppliers should be informed about their performance and evaluated. Furthermore, it is suggested that the supplier management person responsible for receiving the report every day informs the buyer so it is possible to plan goods accordingly.

However, both Monzka et al. (2009) and Gordon (2008) agree that the best routine to evaluate supplier performance is monthly and quarterly, with follow-up meetings each year to analyze results and to discuss improvement options. In the case of unacceptable performance, reporting must be done more frequently, by involving corrective actions (Monzka et al. 2009, p.311). Accordingly, in the process proposal these guidelines have been adapted. A class suppliers are evaluated every month; B class suppliers are evaluated quarterly; C class suppliers are evaluated every half of year, however, after the process is adopted, it can be done on a yearly basis.

In summary, the section 5 proposed supplier performance evaluation process is illustrated in Figure 18.

Figure 18. Proposed Supplier Performance Evaluation Process for the Case Organization



6 The Validation of the Supplier Performance Evaluation Process

This section reports on the results of the validation stage and points to further development and corrections to the initial process. At the end of this section, the final proposal and recommendations are presented.

6.1 The Validation of the Proposed Supplier Performance Evaluation Process

This section validates the supplier performance evaluation process proposed in section 5. The validation process is based on proposal testing in a simple way and the feedback from the case organization's management.

The main goal of this section is to try test the process step by step and to present the proposal to the case organization's management to receive feedback. The proposal building followed the framework steps and included the data gathered from the current state analysis and data from the co-development stage as purchaser interviews and a management workshop. In section 5 the proposal was presented gradually by describing every step of supplier performance evaluation process. Therefore, the validation process conducted by testing the proposal follows the same manner.

The validation process for this proposal consists of two activities – management feedback and a simulation process. At first, the supplier performance evaluation process is presented to management. From the management, some improvement ideas and changes to the process were received. Further, the process steps proposed is simulated and further recommendations are summarized for process improvement.

6.2 Management Feedback

The supplier performance evaluation process was presented in a management workshop and significant improvement ideas as well as requests to the change with regards business specification were received.

Management suggested that a supplier could be informed about the supplier performance evaluation process overall and about our targets by developing and using this process. Furthermore, supplier classification as per performance level could be implemented, for example by using a traffic light system. Suppliers would be informed about their performance class according to our evaluation process, thus the case organization would offer different benefits, in the case that a higher class is reached.

In addition, the case organization management was willing to implement the change with regards to responsibilities of the supplier evaluation process. As per the proposal, a new department or specialist responsible for supplier performance evaluation process is responsible for all of the evaluation process. However, management suggested, that each purchaser process evaluation is done independently. This change will be applied to the process.

6.3 Supplier Performance Evaluation Process in the Simulation

The supplier performance evaluation process simulation was done manually by using partial excel manipulation to measure and consolidate performance data. In the simulation, parts of the components were not added because of the time limit, project on-hold situation in the case organization and the development stage, where all reports needed for the process has not yet been created. As one supplier was selected from the poll already, the first process step, which filters and prioritize suppliers, is skipped.

As an evaluation period one calendar year was taken 01.01.2018 – 31.12.2018 and one A-class supplier, based on purchase value, was selected.

Process step 2 – Establishing performance criteria

For the evaluation performance criteria – delivery performance; quality performance; price and terms are selected. Furthermore, statement based criteria as trust, loyalty and sustainability were selected to be evaluated.

Process step 3 –Weighting performance criteria

Performance criteria were weighted according to proposal: Delivery performance – 40; quality performance – 35; price and terms – 25.

Process step 4 – Collecting performance data

For collection of supplier performance data, tools as Excel (for calculations and scorecard); ERP system and intranet were used.

Delivery performance. Delivery performance in the proposal are measured based on two under criteria: 1) on-time delivery and 2) quality precisely. On time delivery is measured by using the ERP system's report with regards to late, early or in time deliveries. As quantity criteria were in the development stage, *quantity precisely* criteria were not calculated and delivery performance was based on *on-time delivery* only.

Process step 5 – Measuring supplier performance data

Supplier X within the period selected of evaluation, as per the report had delivered 3249 lines, from 3249 order line, but only 654 were delivered on time. Therefore, in –time delivery fulfillment is calculated as per formula:

$$\text{In –time delivery fulfillment} = 654/3249 = 0,804 \text{ (score),}$$

Further weigh it added:

$$\text{On-time delivery weighted score} = 0,201 * 40 = \underline{\underline{31,94}}$$

As the report relating to quantity criteria is in the development stage, this criteria was not calculated.

Quality performance. Quality performance in the proposal were measured based on inbound shipment quality. For the calculation, the case organization's intranet system was used, where reclamations are recorded. As mentioned before, 3249 line has been delivered, 3231 has been accepted, therefore:

$$\text{Inbound shipment quality weighted score} = 3231/3249 * 35 = 34,806$$

In summary, all other criteria were measured in the same manner as per the process described. As an exception, correct invoices were not included in price and terms performance, as a report from the ERP is not available and must be developed by IT.

Supplier's X performance score is 67,858. The calculation and final supplier scorecard is visualized in Table 9.

Process step 6 – Consolidating Results and Reviewing

As the supplier score based on performance criteria measured is under 70 points, its performance is unsatisfactory, therefore it cannot be accepted. At first, as presented in Figure 19, supplier performance is poorest in the delivery performance category where, from a maximum 40 points, the supplier has received 8 points only. Secondly, quality performance is very good. Third, price and terms are almost fulfilled, even though the supplier does not operate in the case organization's payment terms, and therefore 5 points has not been added to the score. Fourth, statement based criteria has been fulfilled only with regards to sustainability, as the supplier runs different sustainability's projects, therefore 10 points has been added to the score.

Table 9 Supplier X performance calculation based on proposed process. Supplier scorecard.

Supplier X	Inbound deliveries	3249		
Performance category	Weight	Fulfilling	Score	Weighted score (weight x score)
Delivery performance	40			
On-time delivery	20	654	0,201	8,052
Quantity precisely	20			
Quality performance	35			
Inbound shipment quality	35	3231	0,994	34,806
Price and terms performance	25			
Best price	10	3249	1	10
Organization's payment term	5	0	0	0
Cost-reduction ideas	5	1	1	5
Correct invoices	5			
Trust			10	
Loyalty			10	
Sustainability			10	10
Total	100			67,858 => Unsatisfactory
Weighted score rating:				
10 – Very poor				
50 – Unsatisfactory				
70 – Acceptable				
100 – Excellent				

Process step 7 – Review and Corrective actions

As the supplier score is 67,858, the performance is unsatisfactory. As the supplier score is unsatisfactory, corrective action must be applied. As the largest issue, delivery performance is detected, therefore corrective action must be applied.

6.4 Finalized Supplier Performance Evaluation Process

Supplier performance evaluation has been presented to the case organization's management team and partially simulated. As a result the management had an improvement idea to sort suppliers into the groups based on their performance, furthermore management were willing to offer suppliers different benefits if a higher supplier level would be reached. Additionally, management suggested to set purchasers as responsible for the supplier evaluation process, instead of a supplier performance department/ engineers proposed, therefore it has been changed.

Furthermore, in the simulation there were a couple of bottlenecks to the smooth process. At first, there was plenty of manual work needed to operate excel reports, as all process reports proposed in the supplier performance evaluation process has not been developed at his point. Second, simulation took a long time as the ERP system operates slowly. Third, when supplier X evaluation results were finalized, the in-time delivery result was critically low, however, after in-depth analysis of the reason most of the delay was within the range +/- 2 days. Therefore I would recommend to measure in-time delivery allowing +/-2 day delay. Fourth, to ensure overall operation clarity and receive all benefits from processed developed, IT tools in the case organization must be developed according to requests.

Overall the process worked well and the objective has been fulfilled as a Supplier Performance Evaluation Process by taking in consideration the case organization's weaknesses, strengths and management expectations. However, the process allows further development being implemented, as per the organization's business needs.

7 Conclusions

Section 7 summarizes the whole thesis study and the developed supplier performance evaluation process proposal.

7.1 Executive Summary

The project "Development of Supplier Performance Evaluation Process in the Case Organization" started in January 2019. Its main objective and goal was to develop the supplier performance evaluation process suitable for the case organization.

The reason for the project was a non-existent standard approach for supplier performance evaluation in the case organization. Furthermore, a supplier performance evaluation process is needed for the case organization to avoid purchasing risks, protect and improve brand reputation, decrease costs associated with the supply chain and most importantly – collaborate with suppliers for new value created.

The project answers the questions:

- What are the current practices of supplier performance evaluation in the case company?
- What are the management's expectations concerning supplier performance evaluation approach?
- What is the best approach to measure supplier performance for the case company?

Research questions were answered by analyzing purchaser survey results and information from the purchaser interviews in a current state analysis in the purchasing department with regards to supplier performance evaluation. Additionally, customer needs were compiled from customer surveys and interviews conducted by the case organization in the years 2018 and 2019. Management expectations were discussed and identified in the workshops organized. As a result, the strengths and weaknesses of current situation regarding supplier performance evaluation in the case organization were detected and compared with management expectations.

Further, information about the supplier performance evaluation process in general was gathered from the literature with additional sources about best practices and other

company approaches. To identify the best approach suitable for the case organization, weakness, strengths and management expectations were taken in consideration when process options given by the literature were selected. The supplier performance evaluation process was designed and validated.

All in all, the project validation showed that the process is suitable and applicable for the case organization, therefore the project objective was reached. However, to implement it within the case organization, IT process development and an implementation process must be organized.

The implemented performance evaluation process will help the company to organize and manage its supplier base. With this simple process, the case organization is able to create visible supplier performance, and therefore detect bottlenecks and to improve overall organization's performance. And most importantly, the process helps to select the right suppliers for the organization's business needs.

7.2 Managerial Implications

Supplier performance evaluation gains more attention in business industries nowadays. Regarding further process development, it is recommended to make a further implementation process to establish the proposal as a part of the organization's daily operations.

For implementation of the process proposed, an implementation project should be designed by including resource planning, strategy and risks aspects, and most importantly training for the purchasing department, as the purchasers are not familiar with supplier performance evaluation. This process must be designed to be fully automatic by the IT department to ensure fast and effective supplier evaluation. Additionally, it is suggested to use a pilot test at first, to see the supplier performance evaluation process as fully developed and operating in the business environment. The results can be used for process improvement and modifications to fit the purchasing department. Furthermore, the proposed performance evaluation process can be applied to other departments.

For the future, the company can develop a Supplier Management program, which includes management of activities with regards to supplier policies, contracts, supplier

relationship management and other activities. It would be a great tool for the company to make sure their suppliers return money, which the company has spent on their suppliers.

7.3 Thesis Evaluation

The objective of thesis is to develop supplier performance evaluation process in the case organization. The case organization do not have a standardized process or any guidelines for the supplier performance evaluation. The thesis has reached the objective set as planned in the research design.

This study is relevant for business managers and any other professional interested to develop a supplier performance evaluation process within a middle sized company based on simplicity and flexibility. This thesis provides information regarding the importance of supplier performance for the buyer organization. Moreover, it gives an understanding that supplier performance has huge impact for businesses customer satisfaction. As a result, the thesis presents a developed supplier performance evaluation process described step-by-step, based on a current state analysis in the case organization and management expectations from the suppliers and their performance. The process ensures a process to evaluate supplier performance that is significant for the Purchasing department and the whole organization.

Further, the implementation steps suggested for the case organization's management ensures smooth and well planned IT process development. The pilot test results gives ability to modify the process to find the best fit for the purchasing department, and moreover, employees training ensures that the process will be operated in the organization with specialists with a high knowledge level regarding the whole evaluation process. Additionally, the next development step for the supplier performance evaluation process is a Supplier Management program, which has been suggested for the case organization. A Supplier Management program ensures improved communication and relationships with suppliers and helps to improve supplier performance.

7.4 Closing Words

A supplier performance evaluation process is a continuous process, which requests developments and improvements, as business organizations and their needs changes daily. This thesis focuses on the simple and flexible supplier performance evaluation process development in the mid-sized company to improve their supplier performance as well as organizations performance based on performance criteria important for the organization's customers. At this point, it is a management decision with regard to implementation of the proposed supplier performance evaluation process in the case organization.

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Appendix 7 – Management workshop regards proposal building

Appendix 8 - Purchaser interview questions for proposal building

Appendix 1

Purchasers' Survey Questions

Supplier Performance Measurement Practice in the Case Company

Thank you for finding a time for this important questionnaire. Please read every question carefully and give your best answer.

As well, do not hesitate to ask, if you have any questions.

*Required

1. Please write your name *

2. What kind of products /product range do you purchase?

* Tick all that apply.

- Fastening accessories / Kiinitystarvikkeet
- Plastic and rubber products / Muovi ja kumituotteet
- Supplies / Tarvikkeet
- Platofast
- Thread-locker and gaskets / Kierrelukitus ja tiivistys
- Electrical products/ Sähkötuotteet
- Electronic Products/ Elektroniikkatuotteet
- Design kits / Sarjat
- Other:

Suppliers

3. Please list three (3) suppliers for your products, which, from your point of view, are most important for the company *

4. Please list three (3) suppliers (if any) for your products, which constantly have order delays, bad customer service, stock outs etc. - unacceptable performance *

5 Please list three (3) supplier (if any) for your product range with prompt deliveries, good customer service and stock availability - high performance *

6. How often do you measure supplier performance? **Mark only one oval.*

- Every 6 months *Skip to question 8.*
- On a special occasions (supplier meetings, reclamation etc.) *Skip to question 8.*
- Once per year *Skip to question 8.*
- I do not measure supplier performance *Skip to question 7.*
- Every month *Skip to question 8.*

Supplier performance measurement**7. Please select the reason, why you do not measure supplier performance? ****Mark only one oval.*

- I do not think it is needed *Skip to question 9.*
- I am not sure how to do it correctly *Skip to question 9.*
- I do not have a time *Skip to question 9.*
- I do not have a tools *Skip to question 9.*
- Other:
Skip to question 9.

Supplier Performance Measurement**8. Please specify how you measure supplier performance (tools used, important performance metrics (price, quality, lead time etc) *****The case company and purchasing department****9 From provided list below, please tick those allegations that apply to the case company**** Tick all that apply.*

- Socially responsible company
- Has a reputation as honest a reliable partner
- World-class standard quality supplier
- Supplier for every client - wide price range and different qualities products
- Focused mainly on financial targets and profitability
- Other:

10. **Please tick those objectives, which applies to the case company's purchasing department: ***

Tick all that apply.

- To ensure the company with a materials/ products to meet customer needs and company's operational needs
- To ensure materials/ products in time
- To ensure best material/ product for the best price
- To ensure purchasing function at the minimum cost
- To ensure material/ product at the best cost
- Close relationships with customers and suppliers is priority
- To keep inventory levels at a practical minimum
- To handle purchasing according the company's statements
- To ensure legal, sustainable and fair trade with our suppliers
- Other:

11. **Which of the business strategies is followed by the company?**

** Tick all that apply.*

- Cost leadership strategy
- Differentiation strategy
- Focus strategy
- Cost focus
- Differen
- Other:

12. **What strategy/ guidelines do you follow in daily purchasing practice (supplier selection, price monitoring, inside communication and communication with suppliers)? ***

13 **How would you define your own values in daily purchasing practice? ***

14. **Please value allegations based on importance in the company (1 - Not important at all; 2 Not very important; 3 - A top priority, but not the most important; 4 - The most important priority) ***

Mark only one oval per row.

1 2 3 4

Purchasing department's input to company's profitability

Effectivity of the purchasing practices and activities negotiations, order processing etc.

	1	2	3	4
Material/ product lead times				
Stock fulfillment				
Supplier-Buyer relationships				
Supplier performance				
Material/product price				
Ethical and Socially responsible purchasing practices				
Daily practice based on company's purchasing guidelines				
Employee's knowledge and suggestions to improve works quality				

15. Does the case company measures the achievement level of allegations mentioned before?

*

Mark only one oval.

- Yes
- No
- Other:

Performance measurement tools

16. Which of the tools listed below you are familiar with?

* *Tick all that apply.*

- The Performance Pyramid
- The Balance Scorecard
- The Performance Measurement Survey
- Fuzzy logic
- Analytic Hierarchy process
- None of those
- Other:

17 Please write below practical tools/ ways, which you would suggest to use to measure supplier performance in the case company *

18. **Please write anything you might want to say about the company, department and/or actual purchasing process (processes, work and communication culture, guidelines etc. - what works well, what does not, suggested improvements).**

Purchasers' Interview Questions

1. How did you selected the most important suppliers for the case organization for the survey?
2. How do you handle those suppliers with unacceptable performance? What do you do to make sure that their performance does not affect the case organizations customers?
3. Why you do / do not measure supplier performance (depends on answer of question 7 from the survey)?
4. Imagine, that you have upcoming meeting planned. Now you have to measure your supplier performance. Tell me, what do you do, step by step.
5. How do you choose the tools used for the measurements and evaluation? How do you select performance criteria?
6. Do you know, what are the company's business targets, strategy and objectives? From where did you receive this information?
7. What is your knowledge regards supplier performance evaluation? Do you think it is important?
8. What do you expect from the implementation process? Would you like to receive extra training, discussions regards project process in workshops, kick-off meetings every week etc.?

Appendix 3

Customer Interview

1. Typical working day with client and background
2. Value creation and expectations - the best sales process for a new customer
3. Value creation and expectations - the best sales process for an existing customer
4. How to increase partnership?
5. How to get in with products already with a reporter?
6. Who should meet? And how? Together as a team?
7. Going digitally?

Appendix 4

Customer Satisfaction Survey Questions

1. Which services of the company's service group you use?
2. For which of the service groups, company is your main supplier?
3. How often do you use their services?
4. Are you satisfied of inside sales customer service?
5. Are you satisfied of company's product offering and availability?
6. Are you satisfied of claim handling?
7. How useful would you consider web shop availability?
8. Please leave your comment

Appendix 5

Management Workshop

Agenda:

- What is Supplier Performance measuring/ evaluation process?
- Why Organization needs it;
- Introduction of the project;
- Discussion of management expectation from suppliers, products and purchasing department

Appendix 6

Criteria for Supplier Evaluation by Hoffman et al. (2014)

<p>Price and terms</p> <ul style="list-style-type: none"> • Quoted price • Rebates • Bonuses • Packaging costs • Payment terms • Advance payments • Disposal costs 	<p>Quality performance</p> <ul style="list-style-type: none"> • Product quality • Experience of supplier • Qualification level of employees • Technology status • Certification • Constancy of performance • Variability of usage • Advertising value of supplier • Quality philosophy
<p>Environmental performance</p> <ul style="list-style-type: none"> • Environmental compatibility • Recycling willingness 	<p>Volume performance</p> <ul style="list-style-type: none"> • Minimum delivery • Volume flexibility • High order volumes • Volume constancy
<p>Credit rating – financial strength</p> <ul style="list-style-type: none"> • Capital resources • Liquidity • Turnover • Cash flow • Legal form of commercial entity • Liability • Image • Competence of management 	<p>Service</p> <ul style="list-style-type: none"> • Object guaranty • Goodwill • After-sales security • Customer Service • Support and advisory service • Speedy processing • Thoroughness
<p>Information/communication performance</p> <ul style="list-style-type: none"> • Communicability • Know-how transfer • Application support • Internet technologies • Worldwide offers • Data protection • Openness • Cooperativeness • Conduct in negotiations • Trustworthiness • Advance information in case of failures 	<p>Logistics performance</p> <p><i>Time performance</i></p> <ul style="list-style-type: none"> • Short delivery periods • Measures for throughput time optimization • Due date reliability • Flexible scheduling <p><i>Location performance</i></p> <ul style="list-style-type: none"> • Distance to customer • Accessibility of storage areas • Transportation connections • Delivery place flexibility <p><i>Delivery performance</i></p> <ul style="list-style-type: none"> • Reliability of delivery • Delivery faithfulness • Exclusive delivery • Processing-oriented delivery • Packaging and transport protection
<p>Innovation performance</p> <ul style="list-style-type: none"> • Technological competence • Development potential • R%D capacities • Rate of innovation • Rate of success 	<p>Know-how</p> <ul style="list-style-type: none"> • Materials • Methods and processes • Problem solution • Creativity • Patents

Appendix 7

Management Workshop II – Proposal Building

Agenda:

1. What is our company's strategy? How can we involve it in purchasing daily processes and decisions?
2. What are main supplier evaluation criteria (what we offer and sell to our customers), which we should set – is it a quality; is it a price, is it availability etc.? Which of those are prior, which one is a second etc.
3. What management expects from purchasing department; suppliers and products?
4. Operational issues regards persons involved, co-development schedule, timeline etc.

Appendix 8

Purchaser Interview II – Proposal Building

Process Co-development of Supplier Performance Evaluation

2nd interview

Actual process stages and steps developed are shown below. By looking on the process given, please think about the questions



1. What do you think about the process given and about the steps? Are those logical? Would you suggest any changes?
2. How you would suggest to proceed all of those steps.
As example about step 1. - How do you think, how the Supplier Analysis should be done for the purchasing department in this company? How the performance criteria should be established and prioritized (weighted)? Etc.
3. Do you have any suggestions regards management of responsibilities regards supplier performance evaluation process?
4. Do you see the need for auditing - internal and external as a process to control the correct supplier performance evaluation?
5. How would you implement this process?
6. Do you see any tread for the new process from the side of the change management principles?
7. What kind of support would you like to have within a ch

