How to evaluate the quality of suppliers in a PIM`s Company X

Tamires Priscila Souza dos Santos;Dr. Jonas Gomes da Silva;Dr. Mariana Sarmanho de Oliveira Lima;David Barbosa de Alencar

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Abstract

The research was carried out in Company X that operates in the electronics industry at Manaus Industrial Pole (PIM). The objective is to propose a system of indicators to evaluate the quality of suppliers, in order to enable their relationship`s continuous improvement. Based in the collection and analyzed data, it was possible to identify six successful cases of suppliers' quality assessment indicators system, which permitted to propose, in partnership with managers, a model that does not need a high cost investment to implement it. Finally, it was suggested to company: a) computerize this process; b) to train employees that work in quality material sector; c) to strengthen relationships with current and future suppliers by showing the company's new vision and model. Doing so, it is believed that the company studied will have a great advance in the field of raw material acquisition, thus obtaining more quality and may be more competitive in the market.

Keywords: Suppliers; Evaluation; Quality.

1. Introduction

The company where this article was developed is located in the Polo Industrial de Manaus (PIM), located in Manaus city, capital of Amazon, Brazil. For private reasons, the company real name will not be revealed, so from now on this company will be cited here as Company X. It is characterized as an outsourced company for providing manufacturing services in electronics, which cover various segments, such as: cameras, digital decoders and printed circuit boards for computers and ATMs. In 2013 it had around 16,135 suppliers registered in its system.

With its structure and market, the company sees the need to evaluate its suppliers in order to achieve its market vision: "To be the world leader in the provision of manufacturing services, enabling its employees to proactively offer their customers. innovative and strategically beneficial solutions."

Given this, there is a concern on the part of the company to offer quality products to its customers, so it is essential to evaluate suppliers, because if the raw materials, goods and materials do not meet the interesting

expectations for the company will certainly not meet. customer needs, compromising customer satisfaction. In this sense, the main objective of this study is to propose a system of indicators to evaluate the quality of suppliers, in order to enable their relationship continuous improvement. To this end, the specific objectives are: 1) to investigate success stories of suppliers' quality assessment indicators system; 2) analyze the company's current supply chain in order to identify active suppliers to be evaluated; 3) propose suggestions for improvements to the company, based on the results obtained in this article.

The research is relevant because: 1) it will provide strategic information that will support the decision making process of managers; 2) provide valuable information for the company to develop and improve the quality of suppliers; 3) in the medium and long term it will help to control the performance of suppliers; 4) it will contribute to the continuous improvement of the relationship between the company and its suppliers; 5) can be benchmarked and implemented in other companies that aim to improve product quality; 6) it can serve as a case study to be used in class room, specially in quality management subject, as well as for new research to be realized by professionals interested in the theme.

2.1 Theoretical Referential

2.1 Reasons for evaluating suppliers

The challenge for companies is to develop an adequate system capable of measuring the potencial performance of their suppliers (SILVA, 2017).

The purpose of the supplier assessment is to prove the ability to meet the specified requirements to be purchased, i.e. to have an adequate quality assurance system, this assessment can be done in different ways: Qualitative assessment by track record: this type of assessment is only acceptable at the implementation stage of supplier procedures. The evaluation is made by analyzing the supply records of certain suppliers and it can be verified that during a period of time there was (FRANCISCHINI, 2004):

• No or small percentage of lots or services delivered with quality problem;

• No or small percentage of lots or services delivered with delays.

Quantitative Valuation by history: this type of valuation involves a scoring method applied to the supply history. It is essential that records are available to apply this type of method.

Evaluating and selecting suppliers according to Francischini (2004), it is not enough just to select the supplier for the good price of his product, but besides this factor, the supplier must meet the qualifying criteria and the classification criteria of supply.

In practice, it is not appropriate to use only one type of valuation for all suppliers of the purchasing company. Firstly, more detailed evaluations place a high burden on quality system management, and secondly not all components have the same relative importance as the final product. (FRANCISCHINI, 2004).

According to Juran (1992), the main objective is to create a relationship that ensures that the product and/or services meet the needs of suitability for use with a minimum of receipt inspection and corrective action. The main activities are: a) define the product and specify the quality requirements; b) evaluate alternative suppliers; c) select suppliers; d) perform joint quality planning; e) cooperate with the supplier during the execution of the contract; f) obtain proof of compliance with requirements; g) approve qualified suppliers; h) conduct quality improvement programs as needed; i) create and use vendor quality ratings.

According to Carvalho and Garvin (2005) to meet market demands, increasingly lacking in quality goods and services, one of the elements that companies need to pay attention to is the relationship with suppliers, establishing a long-term relationship. aiming at mutual collaboration and the pursuit of continually improving product quality.

For Viana (2012) the ability of organizations to meet the needs of their customers increasingly depends on the quality of products and services of contractors.

According to Baily et al. (2000) companies spent 80% of the budget with 20% of suppliers, which increasingly requires closer relationships with these suppliers. According to Martins & Alt (2006), gains in terms of productivity in the purchasing area end up having a major impact on the company's profits. Therefore, it is essential to have a system of indicators for quality assessment of suppliers that is efficient and capable of generating strategic information so that managers can make the best decision regarding supplier management.

2.2 Performance Indicators

It is understood that in order to measure performance, either from an isolated part or from a complex arrangement, the measurements should be concentrated on a manageable set of indicators that eventually produce a combined final index. For Tiago (2017), indicators are measured by cycles and presented at the supplier quality meeting, where they are discussed by a multidisciplinary team that involves several departments such as Quality, Purchasing, Logistics, After Sales and the company's Board.

The methodology for monitoring results through indicators is of great value for measuring any improvement system. This is because it allows the visualization of process oscillations over time. Therefore, the use of indicators in the business world is crucial for several reasons, as they signal what is important, indicating where to ``position`` people so that they know their priorities. They focus everyone's efforts on what matters most, indicating where to make improvements and allocating their time and efforts to maximize return. So, one of the objective of using indicators is to seek the best quality management process to provide adequate analysis and evaluation for decision making. Therefore, the indicators are efficient tools for monitoring changes in the organization and essential for the daily life of managers and administrators, especially when the goal is the search for better levels of competitiveness.

According to Fleury (2000), there is uncertainty in the notion of performance, because sometimes it is not known exactly what should be measured. Pires (2004) defines performance as the quantified information of process outcomes that can be compared with goals, past outcomes, and other processes.

Bititci et al. (1997) stated that the vast majority of researchers believe that there is a need for the formulation of performance measurement systems that include not only financial indicators. Schmidt (2001) states that part of this research arises from the clear need for each company to use measures that are relevant to its own situation.

There are several studies focused on system or organizational performance indicators, such as Van Bellen (2002), Fernandes (2005), Merchant (2006), Machado, Machado, and Holanda (2007), Callado, Callado, and Almeida (2008), Menezes, Guimarães and Sellitto (2008), etc. A broad study of the characteristics of performance indicators used in research conducted in the fields of Administration, Accounting and Tourism from 2000 to 2008 revealed 24 terminologies (page 381) used involving performance indicators as well as

21 concepts (page 382) extracted from the authors researched by Nascimento et al. (2011).

In this research, the indicators are considered like flags that seek to express and demonstrate the reality in a way that is possible to observe and obtain more concrete data to improve the evaluation, they are considered supportive tools to evaluate processes (FREIRE; CHRISÓSOME; CASTRO, 2007) and performance indicators are qualitative or quantitative elements used to detail the scope to which objectives or goals have been achieved, observing the timeframe and resources used.

2.3 Nonconformities

To Macedo (2007) nonconformity is a deficiency in a feature, product specification, process parameter, record or procedure that makes the quality of a product unacceptable, undetermined or beyond established requirements. The process of non-compliance is nothing more than non-compliance with specific requirements, below are mentioned ways of finding a non-compliance: a) Internal Quality Audits / Self Inspection (1st part); b) Second party external audits (customers and suppliers); c) 3rd Party Audits (Headquarters, government agency and certification body); d) Follow-up audits; e) Deviations related to suppliers / service providers, inspections and routine testing of products / processes (controls in process); f) Product analysis results; g) Product batch reconciliation; h) Claims; i) Returns; j) Performance Indicator Results; l) Results of the top management review of Quality Management System.

Managing nonconformities, in addition to being a requirement of current legislation, is a critical success factor of the Quality Assurance System. The objective of any good management system is to prevent recurrence of nonconformities and to proactively prevent them from occurring. Each effective action implemented (corrective, preventive or improvement) represents a step forward in the pursuit of continuous improvement of the Quality System.

Excellence in total quality management dictates that any opposition to established procedures, instructions or standards be properly investigated and recorded, together with any necessary corrective, preventive or dispositive actions. However, each company has its quality policy, which establishes its own guidelines regarding the registration of nonconformities. In any case, it is essential to record, investigate and properly treat nonconformities that significantly impact product quality.

2.4 Supplier Evaluation Cases

2.4.1 Indicators for performance evaluation of suppliers in a cosmetics industry

Komura (2008) proposes a supplier evaluation model where he defines, through interviews with key sectors of the company (purchasing, engineering, quality, planning and manufacturing), the evaluation criteria, which he called external indicators. The data was extracted from the company system. At the end, a combined percentage score was obtained and analyzed according to the goal estimated by the organization. The purpose of the evaluation is to reward suppliers, as well as to seek for quality development practices of the materials supplied, increasingly consolidating the company's supply chain.

2.4.2 Supplier Evaluation Model at the Regional Triticola Santiaguense Ltda Cooperative

Glasenapp at al. (2003) proposed an evaluation model based on the partnership with the purchasing sector of the company from which the data were collected. After collection, the data resulted in the supplier

evaluation spreadsheet, where it was organized in a way that allowed the satisfaction measurement provided by the suppliers of the Tritícola Cooperative sectors.   Taking into account previously established criteria, the analysis performed on the collected data allowed to obtain a knowledge base for the effective management of suppliers. In addition, it provided continuous improvements to the organization's evaluation process, as the results obtained were more focused on a given focus, thus providing subsidies for decisions of specific interest to the company.

2.4.3 Supplier evaluation model through performance indicators

Cavalcanti at al. (2009) proposed a supplier evaluation model based on performance indicators capable of providing the decision maker with fast and quality information. From the criteria defined by the decision maker, an order of alternatives sorted by preferences is established, where scores are given for each criterion and at the end a general performance index for each supplier, called the IDF (Supplier Performance Index), is determined. which is the result of the arithmetic mean of the evaluated criteria, which are: distribution, quality certificates and warranty.   Therefore, the adopted model becomes suitable for the company as it contributes positively to the performance of the organization's results and increase of the company's profits, besides enabling partnerships that will assist in the implementation of quality and productivity improvement programs.

2.4.4 Northrop Gromman Supplier Performance Appraisal Model.

The international company Nothrop Gromman adopted 4 indicators to evaluate its suppliers, as follows: 1- Quality assessment profile; 2 - Deliveries, 3 - Customer Satisfaction; 4 - Structured process / Lean six Sigma, where a score was assigned, which at the end, is summed, and it is possible to see in a table the general classification of suppliers.

2.4.5 Supplier evaluation model through performance indicators.

The company ALCOA adopted a predefined criterion based assessment system which establishes a score for the supplier depending on the assessed criterion, for example, quality is measured by the PPM criterion, where there are PPM ranges with their respective scores. The main criteria used to evaluate suppliers are: quality (PPM criteria - Parts per million); deliveries (delivery time criteria - <6 days) and service (criteria to evaluate the service provided by suppliers). The benefits of applying Performance Indicators in organizations have drawn the attention of many managers as it helps companies achieve better results through their most effective method (RODRIGUES, 2015).

2.4.6 Supplier Evaluation Model by Performance Indicators

In order to evaluate its suppliers, KODAK adopted certain criteria to ensure that they meet company requirements or even above established levels where a number of criteria are measured including, the minimum performance for a quality management system, product or service, performance measures such as DPPM, delivery performance, time, and productivity performance. The data that makes up these performance measures is managed across multiple systems. By evaluating these criteria, the company aims to establish a partnership relationship with suppliers, aiming to consistently measure their performance

over time, and provide significant results in reducing failures that compromise the quality of the final product.

The Table 1 present a summary of the indicators explored in the previously reported cases.

Table 1 - Cases used to measure supply indicators performance

CASE	Indicators	Definition	Data source	Points
Komura (2008)	1. Wape (Tissue Trend) 2. Compliance with MPS 3. Lack of Material 4. Compliance with MRP 5. Critical Requests 6. Receiving Time	Interviews with key company sectors.	Internal system.	Combined (%) - Goals
Glasenapp at al. (2003)	1. Communication 2. Compliance 3. Purchase and Receipt Documentation 4. Quality 5. Profitability	Defined together with the company team - Proposed goals.	Data collection - purchasing, checking and inventory control.	Satisfaction score (points: 0 to 3)
Cavalcanti at al. (2009)	1. Distribution 2. Quality Certificates 3. Warranty	Defined based on evaluation models and performance indicators.	Internal system	Weights according to importance
Nortrop Gromman Company	1. Quality assessment profile; 2. Deliveries; 3. Customer Satisfaction; 4. Structured Process / Lean six Sigma.	Defined by the company.	Internal registration	Supplier Scorecard Rating Blue: 91-100 Green: 75-90 Yellow: 51-74 Red: 0-50
ALCOA Company	1. Quality (PPM criterion - Parts per million); 2. Deliveries (delivery time criteria - < 6 days); 3. Service (criteria for evaluating the service provided by suppliers).	Defined by the company.	Internal registration	Scoring according to importance and punctuation at intervals.
KODAK Company	1. DPPM; 2. Number of corrective actions requested.	Defined by the company.	Internal registration	Score according to degree of importance.

Source: Author

In addition, the company expects to reduce defects and improve its overall performance, the number of corrective action orders will decrease, productivity will increase and quality costs will decrease and the number of certified suppliers will increase. Utilizing this vendor evaluation system provides year after year satisfaction and improvement in the organization's performance by establishing a vendor base.

3. Methodology

The research is applied with a qualitative approach through case study and bibliographic survey. Also, the research was realized a seven years ago as part of a graduate student final project defended in Industrial Engineering Department of Federal Amazon University. Basically, to development a Supply indicator performance evaluation system to Company X, it was necessary seven phases as shown in Table 2.

Table 2 - Research Schedule

PHASES	Dec/12	Jan/13	Feb/13	Mar/13	Ap / 13
Bibliographic Survey	14-20	-	-	-	-
Definition of indicators	-	15	-	-	-
Data Collection	-	-	15	-	-
Data consolidation in spreadsheet	-	-	20	-	-
Data analysis	-	-	-	01	-
Drafting of the Article	-	-	-	10	-
Review and Article Delivery	**-**	**-**	**-**	**-**	**05**

Source: Author

3.1 Bibliographic Survey

At this stage, we sought to make the literature review aiming to identify articles and company cases that addressed quality assessment of suppliers.

3.2 Definition of Indicators

After bibliographic survey, it was shown to Company X manager some criterias to develop the indicator system. Since Company X had a computerized internal system, it was proposed as criteria the combination of qualitative and quantitative assessment by historic approach by monitoring the results through performance indicators directly related to the suppliers' performance.

The indicators were established according to the objectives proposed in this article and the feasibility of their application in the company. Then, in a meeting made in January 15th 2013 with strategic team from Engineering, Quality, Plan and Purchase sectors, the bellow indicators were defined:

Indicator 1) DPM indicator: defects per million;

Indicator 2) SRR indicator: number of lots returned in relation to the number of lots received;

Indicator 3) SCAR indicator: number of corrective action plans requested to suppliers.

These indicators were established to reduce quality costs related to: a) batch rejection processing costs: can be estimated based on the processing and handling document costs of each rejected batch; b) claims investigation costs: costs associated with human resources and others involved in solving the quality problems detected on suppliers' items; c) receipt inspection costs: these represent an estimate of the receipt inspection costs for a particular item from a certain vendor. The amount of these costs may vary widely, depending on the reputation of the supplier and his previous supplies; d) costs of nonconforming products identified upon receipt inspection: costs incurred in rework, servicing, replacement, machinery adjustment

and others if a presented product is nonconforming and is not identified prior to processing or prior to processing. be delivered to the customer.

It is important to note that the quality cost evaluation system varies from organization to organization, and in organizations that are more updated in terms of management, the group of "few and vital" suppliers is taking into account (addapted from MARINHO & NETO, 1997).

As a guideline of the study, the suppliers present in the company's database were analyzed, according to deliveries made during the period of December/12 to February/13, where the main focus is on incidents related to nonconformities in the materials supplied.

Table 3 - DPM Indicator

Goal	Score Range	
	Range - DPM	Performance (%)
	0.00 - 0.00	100%
	1.00 - 50.00	96%
	51.00 - 100.00	92%
	101.00 - 150.00	88%
	151.00 - 200.00	84%
	201.00 - 233.00	80%
	234.00 - 500.00	76%
	501.00 - 750.00	72%
	751.00 - 1,000.00	68%
	1,001.00 - 1,250.00	64%
	1,251.00-1,500.00	60%
Demonstrate the supplier incident level based on the number of nonconforming parts divided by the quantity of material delivered by the supplier during a given period.	1,501.00 - 1,750.00	56%
	1,751.00 - 2,000.00	52%
	2,001.00 - 2,250.00	48%
	2,251.00 - 2,500.00	44%
	2,501.00 - 2,750.00	40%
	2,751.00 - 3,500.00	36%
	3,501.00 - 4,250.00	32%
	4,251.00 - 5,000.00	28%
	5,001.00 - 5,750.00	24%
	5,751.00 - 6,500.00	20%
	6,501.00 - 7,250.00	16%
	7,251.00 - 8,000.00	12%
	8,001.00 - 8,750.00	8%
	8,751.00 - 10,000.00	4%

Source: Author

3.2.1 DPM Indicator: defects per million

This indicator analyzes the results of a process in terms of the number of nonconforming components. Its main function is to demonstrate suppliers' results regarding the number of non-conforming components delivered to the factory. This indicator provides the information to assess whether the supplier is improving its results relative to the number of incidents, as can be seen in Table 3.

DPM shows the number of defective parts or materials delivered by a particular vendor, as a function of the total quantity of parts delivered over a given period. This indicator allows an analysis of the defective parts against one million components supplied and takes into account all defective parts or materials that have entered the company and have been inspected or used after the production process where the calculation of this indicator can be performed. through the calculation below:

DPM = (Number of Non-Compliant Parts / Number of Parts Supplied) x 1,000,000 (Equation 1)

3.2.2 SRR indicator

This indicator analyzes the results of a process in terms of the number of nonconforming batches. Its main function is to demonstrate suppliers' results regarding the number of non-compliant batches returned. This indicator provides the information to assess whether the supplier is improving its results in relation to the number of incidents, reflecting directly on the assessment of deliveries as can be seen in Table 4.

Table 4 – SRR indicator

Goal	Score Range	
Demonstrate the level of vendor incidents based on the number of batches returned divided by the number of batches delivered during a given period.	0.00 - 0.09	100%
	0.10 - 0.34	85%
	0.35 - 0.59	60%
	0.60 - 0.74	45%
	0.75 - 1.00	30%
	> 1.00	**0%**

Source: Author

3.2.3 SCAR indicator

This indicator is considered one of the most important parts of the supplier evaluation and management process, as it is through this step that corrective actions are requested from suppliers for the definitive solution of nonconformities.

Suppliers are formally notified through the Supplier Corrective Action Request (SCAR), where they become aware of the failures arising from the material supplied as well as the impacts generated on the company. In addition, they need to return with action plans answered and implemented for effective noncompliance resolution.

Table 5 - SCAR Indicator

Goal	Score Range	
Evaluate suppliers through the amount of corrective action plan requested.	0 SCAR issued	100%
	1 SCAR issued	50%
	Entre 2 e 3 SCARs issued	25%
	> 3 SCARs issued	**0%**

Source: Author

3.2.4 General Indicator of Supplier Quality

This indicator aims to classify suppliers from the arithmetic mean of the score achieved in the proposed indicators (DPM; SRR and SCAR), where the result will be classified as Table 6:

Table 6. General Indicator of Suppliers

Ranking	Description	Score
A	Good	91% to 100%
B	Satisfactory	81% to 90%
C	Acceptable	60% to 80%
D	Unacceptable	0% to 59%

Source: Author

3.2.5 Data Collection

This phase took place after the definition of the indicators, which sought to understand the operation of the company's system to extract the data needed to propose the indicator system to assess the quality of the company's suppliers.

Although the company had 16,135 registered suppliers, the data collected only applied to active suppliers, who made deliveries or made returns during the period.

3.2.6 Data Sheet Consolidation

During this phase the data obtained were organized and structured in a spreadsheet, where indicator formulas were added to optimize the evaluation system.

Data were collected monthly, where in the end data were consolidated in the general indicator for supplier quality rating.

4. Results

The results obtained during the collection period allowed to evaluate the quality of the suppliers according to the established criteria, where it was verified that of the 1,310 suppliers evaluated during the period from November/12 to March/13, around 1,236 suppliers were classified with good performance, 29 were classified with satisfactory performance, 9 with acceptable performance and 36 with unacceptable performance, as shown in Table 7.

Table 7. General Indicator

Rank	Description	Score	November/12		December/12		January/13		February/13	
			Total suppliers	Average	Total suppliers	Average	Total suppliers	Average	Total suppliers	Average
A	Good	91% to 100%	246	100%	329	100%	327	100%	334	100%
B	Satisfactory	81% to 90%	5	83%	9	83%	12	83%	3	83%
C	Acceptable	60% to 80%	2	71%	5	66.67%	0	0%	2	70%
D	Unacceptable	0% to 59%	10	21.3%	6	29%	10	23.93%	10	22.9%
Total suppliers evaluated			263	-	349		349		349	

Source: Author

In this sense, it was found that during the study period, in December there was a reduction in the number of suppliers classified in D, with only 6 suppliers, on the other hand, in the following periods the number remained in 10 suppliers in this category.

To better understand and analyze the indicators, the Table 8 shows the stratified data of the general indicator (DPM; SRR and SCAR), where it is possible to check which indicators need the company's attention and action with the supplier.

Table 8 - Indicator stratified data

Rank	Description	Score	November/12			December/12			January/13			February/13		
			DPM	SRR	SCAR	DPM	SRR	SCAR	DPM	SRR	SCAR	DPM	SRR	SCAR
A	Good	91% to 100%	0	0	0	0	0	0	0	0	0	0	0	0
B	Satisfactory	81% to 90%	0	0	5	0	0	9	0	0	12	0	0	3
C	Acceptable	60% to 80%	0	0	12	982,000,000	1	0	0	0	0	0	0	6
D	Unacceptable	0% to 59%	392,500	34.3	45	1,240,212,698	107	13	165,974	54.4	31	238,996	142	50
Total suppliers evaluated			263			349			349			349		

Source: Author

From Table 8, it is noted that the DPM and SCAR indicators need more attention from the organization, as they directly affect the quality indicator of suppliers, since, with the high index, the supplier does not get any score in the respective indicator.

Given the data obtained, the company has the basis for decision making, as well as can act strategically on suppliers who failed to achieve an appropriate score, in other words, help through partnerships suppliers who do not meet expectations. from the company.

From the supplier performance view, the company has a range of options to implement its supplier development and quality improvement programs, where the starting point is the D rated suppliers, which directly affected the costs. quality of the organization as a function of the batches and parts that failed due to nonconformities detected, in addition to issuing SCARs with corrective action request.

The proposed model of indicators makes possible the analysis of the performance of each supplier, allows the organization to monitor the performance of suppliers over time, besides keeping a history to visualize the behavior of the indicators, it will be possible to observe the variations, increase or decrease of the suppliers in their respective classifications. From this analysis, it is recommended that the company look for practices aimed at continuous improvement and align with the evaluated indicators, so that both can move towards the common goal, which is the quality of materials.

5. Final Considerations

The objective of this article is to propose a system of indicators to evaluate the quality of suppliers, in order to enable the relationship continuous improvement among company and its suppliers.

Based in the collection and analyzed data, it was possible to identify six successful cases of suppliers' quality assessment indicators system, which permitted to develop Company X model.

As the company did not authorize the disclosure of supplier names, the evaluation indicator system was generally proposed, where the details of each supplier were provided to the company through the spreadsheet, where the data were consolidated.

Based on the company's need to become a leader in manufacturing services, an indicator-based evaluation system was proposed, in which the criteria were adopted in relation to material quality. In this system, three indicators were defined, where a score was assigned according to the interval criterion. At the end, a general indicator was obtained to assess the quality of suppliers as A (Good), B (Satisfactory), C (Acceptable) or D (Unacceptable) categories.

During academic partnership with company, it was possible to develop a proposal model that does not need a high cost investment to implement it. In the evaluation, it is suggested to company: a) computerize this process; b) to train employees that work in quality material sector; c) to strengthen relationships with current and future suppliers by showing the company's new vision and model. Doing so, undoubtedly the company studied will have a great advance in the field of raw material acquisition, thus obtaining more quality and may be more competitive in the market.

During the construction of this article it was found that the changes suggested with the model generated discomfort in people, because the suggestion of evaluating suppliers led to new activities to be developed, besides the dedication of time for data collection. However this resistance was bypassed by the benefits

that the evaluation provided, as well as managers' awareness among employees about the importance of this evaluation system, mainly by assisting in the analysis of suppliers who need help to improve quality levels.

It is suggested for future research, a study on effective strategies to develop strong partnerships between companies and suppliers. The more dialogue and knowledge are shared with whom you negotiate, the more likely the partnership will work.

It is also suggested to company perform a monthly audit on suppliers that have been rated in D category, and request an action plan to improve their indicator for the following month.

In addition, for the company to ensure that the supplier is involved and committed to the quality of the materials provided, it is suggested to realize monthly meetings to present the supplier's score, aiming to establish strategies to improve the indicator over the following month.

6. Acknowledgements

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