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Application of the Methodology of Analysis and Solving Problem (MASP) in a lingerie clothing industry

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ABSTRACT
The current world scenario shows exponential development and traditional companies find it difficult to keep up with the speed of this development, so in order to keep up with this pace, it is necessary to develop a competitive strategy and look for a flexible system so that the company is able to adapt to the needs of the market and the economy.

Keywords: Methodology for Analyzing and Solving Problems (MASP), Lingerie, Garments.

INTRODUCTION

The current world scenario shows an exponential development and traditional companies have difficulties to keep up with the speed of this development, so to keep up with this pace, it is necessary to develop a competitive strategy and seek a flexible system so that the company is able to adapt to the needs of the market and the economy.

With this comes a need to rethink ways of working, overcome resistance to change, and acquire the mindset that everyone grows when the company grows.

In this context, the objective of this work is to apply the MASP (Methodology of Analysis and Problem Solutions) to manage day-to-day problems. The work was conducted in a clothing industry, due to the need to optimize its performance, and the quality sector is in constant development. Through the implementation of this methodology aligned with the quality tools in routine problems, it was sought to develop the concepts of Quality within the company and make the employee work focused on continuous improvement (*kaizen*).

OBJECTIVE

In this context, the objective of this work is to apply the MASP (Methodology of Analysis and Problem Solutions) to manage day-to-day problems.

To fulfill its objectives, the work establishes a review of the literature, methodological procedures adopted, empirical results and, finally, its conclusions.

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METHODOLOGY

A bibliographic research was carried out, which, according to Gil (2002), "is developed based on material already elaborated, consisting mainly of books and scientific articles", where the theoretical basis for carrying out the field research described in this work was extracted. The work, in its technical procedures, is classified as a case study, according to Gil (2002), because it presents a detailed and exhaustive study of an object, so that it allows its knowledge in a broad and detailed way. According to Gil (2002), regarding its nature, this work is classified as an applied research, as it aims to generate knowledge aimed at solving specific problems for practical application.

COMPANY DESCRIPTION

A large clothing company operating in the lingerie business for more than 40 years in the market and in recent years has invested in the rejuvenation of the brand. Their products are associated with comfort, well-being, practicality and quality. The company is strongly involved in investments in production technology, usage tests, research on consumer habits and fashion trends, as its production is aimed at extremely demanding customers, women.

DEFINITION OF THE CURRENT SITUATION

Currently the company is going through a moment of growth and it is very important to be able to develop, and apply a methodology of analysis and problem solutions, because with this methodology, the company will be able to grow with a great standard of quality, standing out more and more in the lingerie manufacturing market.

DEVELOPMENT

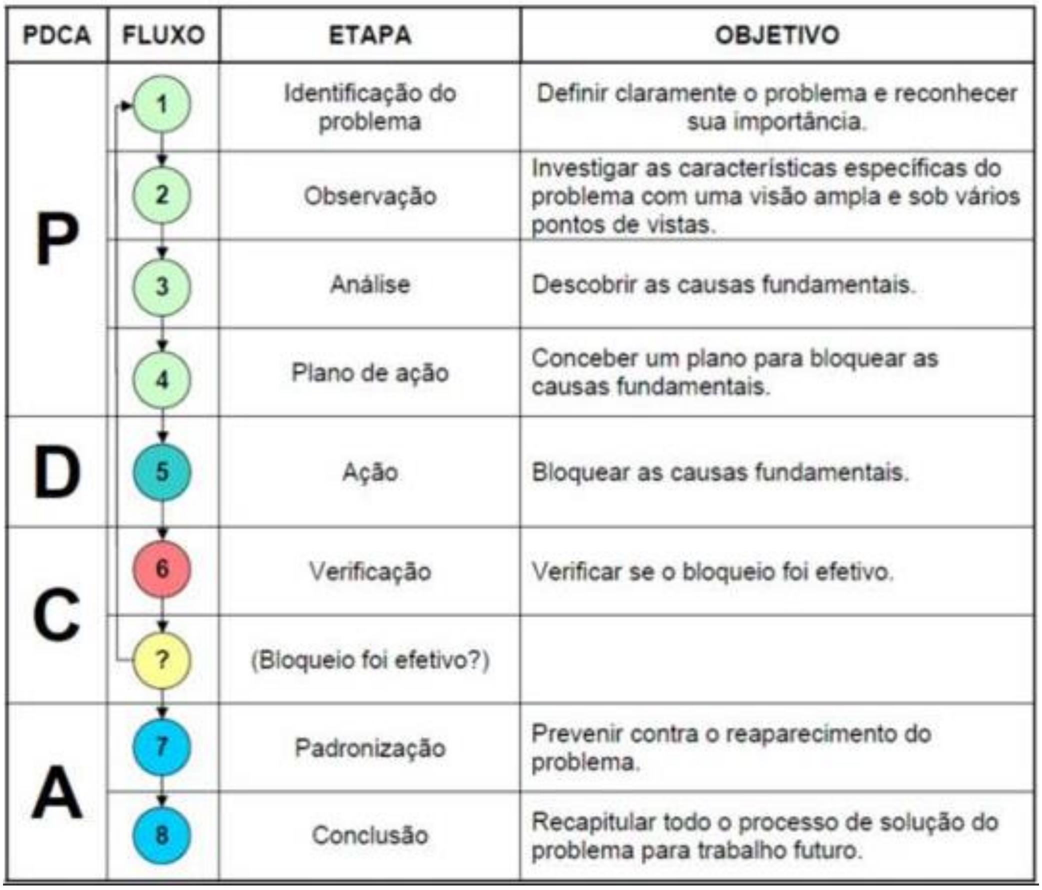
The lack of standardization of operations, focus on process improvement, cost reduction and growth are difficulties that need to be overcome so that the company can become competitive and grow in the market. In this sense, there is a need for companies to diagnose the stage in which their processes are in relation to the quality philosophy and, as a consequence, to define and implement a Quality Management System (QMS). One way for companies to be guided by this objective is through management tools and the methodology of analysis and problem solving (MASP), which will be discussed in this chapter.

MASP (ANALYSIS AND PROBLEM SOLVING METHODOLOGY)

The problem-solving method, also called "QC Story" by the Japanese, is an important tool to be used so that quality control can be exercised. According to Alvarez (2003), MASP is perhaps the most widespread and used problem-solving method in Brazil since its arrival. This tool has been helping to provide numerous improvements in various fields of industry from various segments.

According to Kume (1993), the solution to a problem is to improve the deficient outcome to a reasonable level. The causes of the problem are investigated from the point of view of the facts, and the cause-and-effect relationship is analyzed in detail. Unfounded decisions, based on imagination or theoretical cogitations, are strictly avoided, since attempts to solve problems by such decisions lead in wrong directions, incurring failure or delay in improvement. To avoid the repetition of causal factors, countermeasures are planned and implemented for the problem. This procedure is a kind of story or plot of quality control activities, and because of this, people call it QC Story. Figure 1 describes the steps of the process and a brief explanation of the purpose of each one.

Figure 1 - MASP Steps



PDCA	FLUXO	ETAPA	OBJETIVO
P	1	Identificação do problema	Definir claramente o problema e reconhecer sua importância.
	2	Observação	Investigar as características específicas do problema com uma visão ampla e sob vários pontos de vistas.
	3	Análise	Descobrir as causas fundamentais.
	4	Plano de ação	Conceber um plano para bloquear as causas fundamentais.
D	5	Ação	Bloquear as causas fundamentais.
C	6	Verificação	Verificar se o bloqueio foi efetivo.
	?	(Bloqueio foi efetivo?)	
A	7	Padronização	Prevenir contra o reaparecimento do problema.
	8	Conclusão	Recapitular todo o processo de solução do problema para trabalho futuro.

Fonte: https://blogdaqualidade.com.br (2019)

If these eight steps are understood and implemented in this sequence, improvement activities will be logically consistent and results will accumulate on a regular basis. At times, this procedure may seem to be full of beating around the bush to solve a problem, but in the long run, it is the shortest and, above all, safest way. This cycle is the basis for improvement projects, not only aiming at improvement following pre-established steps, but also subsequent steps such as problem solving and methodology (FONSECA and MIYAKE, 2006).

For Peinado (2007), what makes the PDCA cycle so special is precisely the idea that improvement activities should occur in cycles, which involve planning and experimentation with innovations, but also stages of consolidation of the benefits obtained or reassessment of changes that did not bring the expected results.

The definition of Campos (2004) says that the PDCA Method is a way to achieve the goals, a concept that induces the steps of the cycle. Therefore, to start the PDCA Cycle it is necessary to define a goal to be achieved.

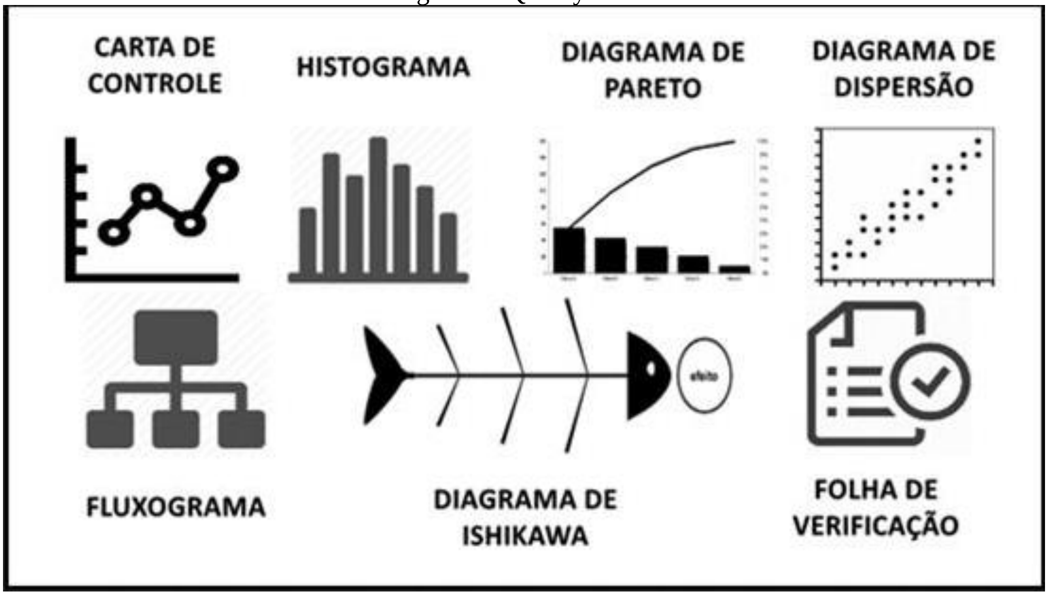
QUALITY TOOLS

The technical literature on quality identifies seven basic tools, illustrated in figure 2, to be used to help locate, understand, and eliminate problems that affect the quality of the product or service. Experts say that most business problems can be analyzed and solved with the use of these seven tools. These are simple tools, but if used correctly, they become a powerful tool in problem solving (PEINADO, 2007).

According to Werkema (1995), the seven MASP tools, also called quality tools, can be related as follows:

- Flowcharts or Process Diagrams;
- Check sheet;
- Statistical process control charts;
- Pareto analyses;
- Histograms;
- Cause and effect diagrams;
- Scatter or correlation diagrams.

Figure 2 - Quality Tools



Fonte: http://www.portal-administracao.com (2019)

FLOWCHARTS OR PROCESS DIAGRAMS

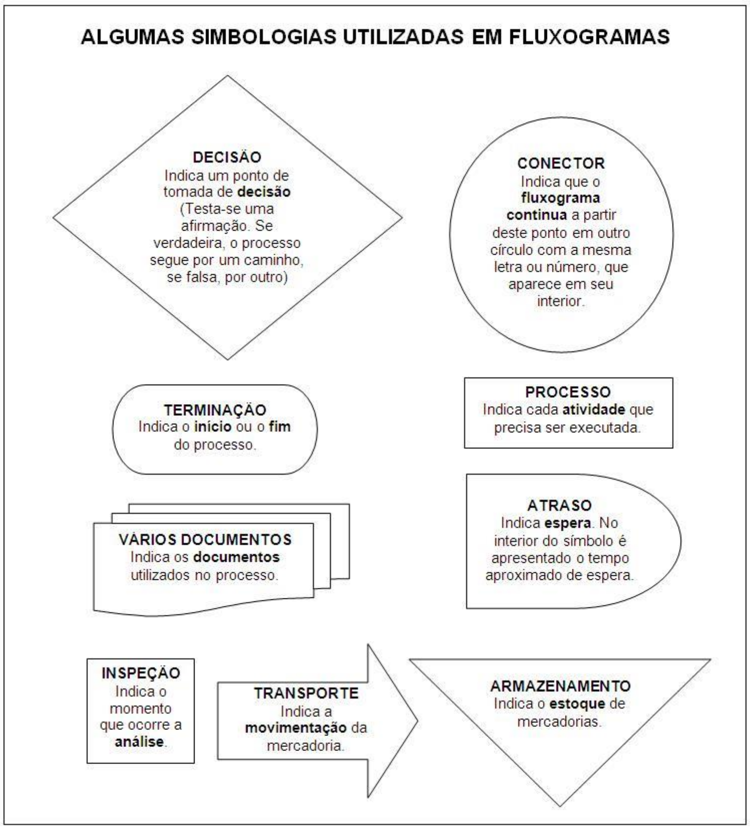
The flowchart is a diagram used to represent, by means of graphic symbols, the sequence of all the steps followed by a process. When a process is described in the form of a flowchart, it is easier to visualize and understand how it works.

The creation of a flowchart is also known as process mapping. The flowchart is a very useful tool and can have the following applications:

- Improve the understanding of the work process;
- Show how the work should be done;
- Create a work standard or a procedure standard.

The analysis of the flowchart of a process allows it to be evaluated, seeking a simpler, safer and more practical way to execute it. Very often, when a process flowchart is drawn, problem points or areas are identified, which were not noticed on a day-to-day basis. These points can then be worked on and the process can be improved, towards Total Quality. Figure 3 shows some symbologies used in flowcharts with a brief explanation of each symbol.

Figure 3 - Symbologies used in Flowcharts



Source: Prepared by the authors (2019)

VERIFICATION SHEET

According to Werkema (1995), the purpose of the check sheet is to facilitate data collection in the best possible way and to organize this data during collection, eliminating the need for manual rework. This tool works as a form with the items to be investigated already printed, in order to facilitate data collection. In quality management, it is not possible to make sound decisions or propose improvement plans based only on assumptions and arguments that are not based on facts and data.

STATISTICAL PROCESS CONTROL CHARTS

These graphs are used to verify that a given process is within the control limits, that is, that the process is proceeding as planned. Being under control doesn't necessarily mean that the product meets specifications, it just means that the process is consistent and can be considered consistently poor if it doesn't meet the design specifications.

PARETO ANALYSIS

The Italian economist Vilfredo Pareto, when verifying the non-uniformity of the distribution of income among people, concluded that 80% of the country's wealth was concentrated in the hands of 20%

of the people. This Pareto thesis was also examined by Juran and, in the specific case of quality control, it was found that "in most cases, defects and their associated cost are due to a small number of causes". It is also often said that "the Pareto diagram serves to separate the few vital problems from the many trivial problems."

The Pareto chart demonstrates the relative importance of a problem's variables, in other words, it indicates how much each of these variables represents, in percentage terms, in relation to the overall problem.

The Pareto chart is a bar-shaped chart that visually shows the impact of each of the events being studied. The events with the highest participation in the problems should be solved first. When there are multiple causes for a problem, usually one or two of these causes are responsible for most of the problem. Therefore, instead of seeking the elimination of all causes, it is possible and practical, initially, to act to eliminate only the main cause. With this, most of the problem is quickly solved.

One of the issues usually addressed by the quality sector is non-conformities. Such non-conformities can affect with greater or lesser impact, due to rework, the loss of time, labor and raw material with a subsequent increase in cost. Therefore, such non-conformities, as well as machine stoppages and increases in machine cycles, should work as an opportunity for process improvement, through an investigation and solution of the causes of the problems (SANTOS et al., 2012).

HISTOGRAM

According to Werkema (1995), its objective is to know the characteristics of the distribution associated with a population of interest, in this case a sample of this population is taken and the values assumed by the variable considered are measured for the elements of the sample.

CAUSE AND EFFECT DIAGRAM

Also called a fishbone diagram or Ishikawa diagram, it is a graphical representation, which assists in identifying, exploring, and presenting the possible causes of a specific situation or problem.

The cause and effect diagram shows only the possible causes of a given occurrence. These possible causes represent hypotheses that need to be analyzed and tested one by one in order to prove their veracity and determine the degree of influence or impact on the situation under analysis. Surveying the possible causes is usually done in a brainstorming session. In this case, the cause-and-effect diagram encourages people's participation in problem analysis.

In general, in manufacturing organizations, the causes of problems are typically directly linked to six areas, known as the six "M": Labor, Materials, Machines, Measurements, Methods, and Environments.

For service organizations, these areas are not applied, being replaced by others, such as: policy, legislation, place, personnel, procedures etc.

SCATTER PLOT

A tool used when you need to visualize what happens to a variable when another variable undergoes some kind of change. In this way, it is possible to know if the two have some kind of correlation (a characteristic of quality and a factor that affects it). It will not be covered in this article.

PRESENTATION AND DISCUSSION OF RESULTS

The results of the case study are presented below.

ELABORATION OF THE FLOWCHART

To prepare a flowchart, first of all, it is necessary to understand and raise the steps of the process. Generally, this survey is done through interviews and meetings with its executors. A long process should be broken down into several smaller processes, as many as necessary. Practice has shown that, preferably, a flowchart should not be longer than one page.

Flowchart analysis

After the construction of the flowchart, it is easier to make an analysis, identifying if there is any deficiency or any point that can be improved.

Table 1 shows an example of a process diagram applied in the production stages of the manufacturing process.

Table 1 - Process Diagram

Operação	Símbolo	Distância Acumulada	Tempo por Atividade
RECEBER MATÉRIA PRIMA	○	0 m	20 min.
TRANSPORTAR P/ INSPEÇÃO	⇨	15 m	5 min.
INSPECIONAR	□	15 m	40 min.
TRANSPORTAR P/ ALMOXARIFADO	⇨	25 m	10 min.
ARMAZENAR	▽	25 m	2 dias
AGUARDAR ORDEM DE PRODUÇÃO	D	25 m	3 dias
TRANSPORTAR P/ PRODUÇÃO	⇨	120 m	1 hora
CONFECCIONAR	○	120 m	30 min.
INSPECIONAR	□	120 m	10 min.
TRANSPORTAR P/ EXPEDIÇÃO	⇨	150 m	1 hora
ARMAZENAR	▽	150 m	4 dias

Source: Prepared by the authors (2019)

APPLICATION OF A CHECK SHEET

Table 2 shows an example of the practical application of a check sheet in the context of the lingerie company.

Table 2 - Verification Sheet

FORMULÁRIO DE CONTROLE DIÁRIO - PRODUÇÃO INTERNA

CÉLULA: _________ **REF. DIA:** _______

QT REVISADA:

REF.	COR	TAM.	NÃO CONFORMIDADES	QT	TIPO	ORIGEM

OBSERVAÇÕES:

DATA: _____/_____/_________

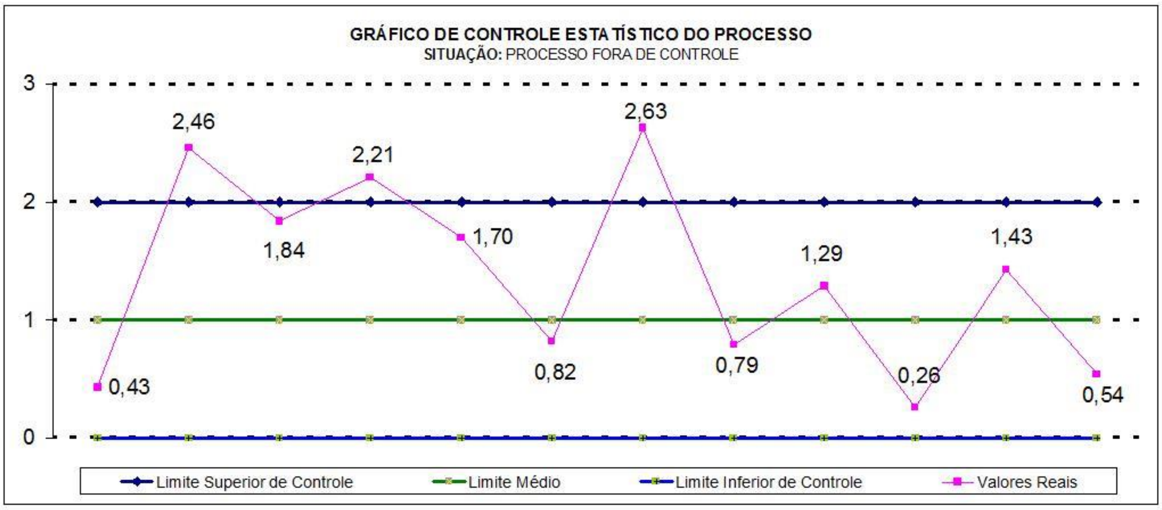
____
ASS. RESPONSÁVEL

Source: Prepared by the authors (2019)

APPLICATION OF THE STATISTICAL PROCESS CONTROL CHART

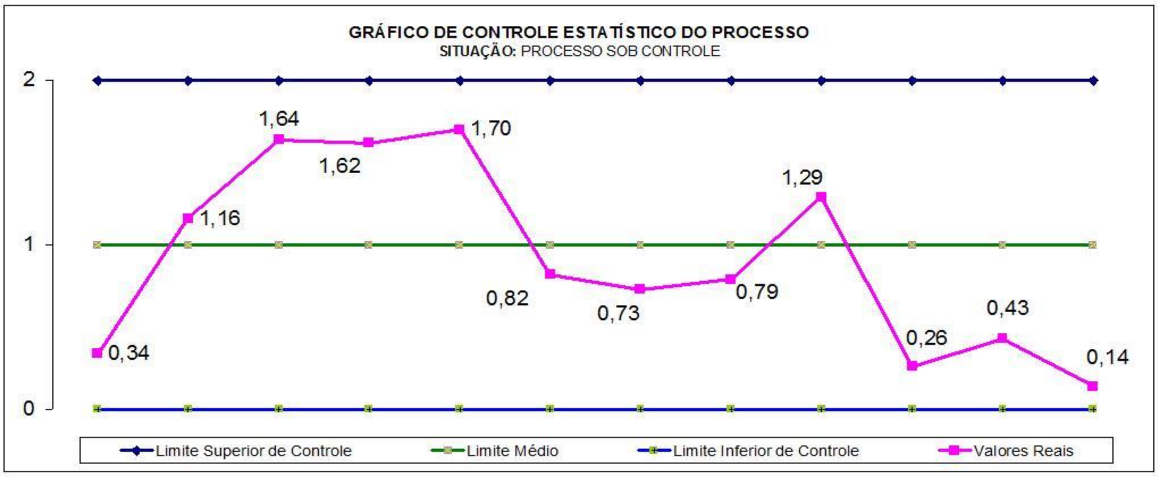
Figure 4 shows an out-of-control situation with 3 points exceeding the upper limit. After the analysis and removal of anomalies that are out of bounds, it was noticed in figure 5 that the process is back under control.

Figure 4 - Zip Code Chart - Situation Out of Control



Source: Prepared by the authors (2019)

Figure 5 - Zip Code Chart - Situation Under Control



Source: Prepared by the authors (2019)

PARETO ANALYSIS

Steps to build a Pareto chart

- Step 1: Redo the check sheet by ordering the values in descending order of magnitude;
- Step 2: Add a column indicating the accumulated values;

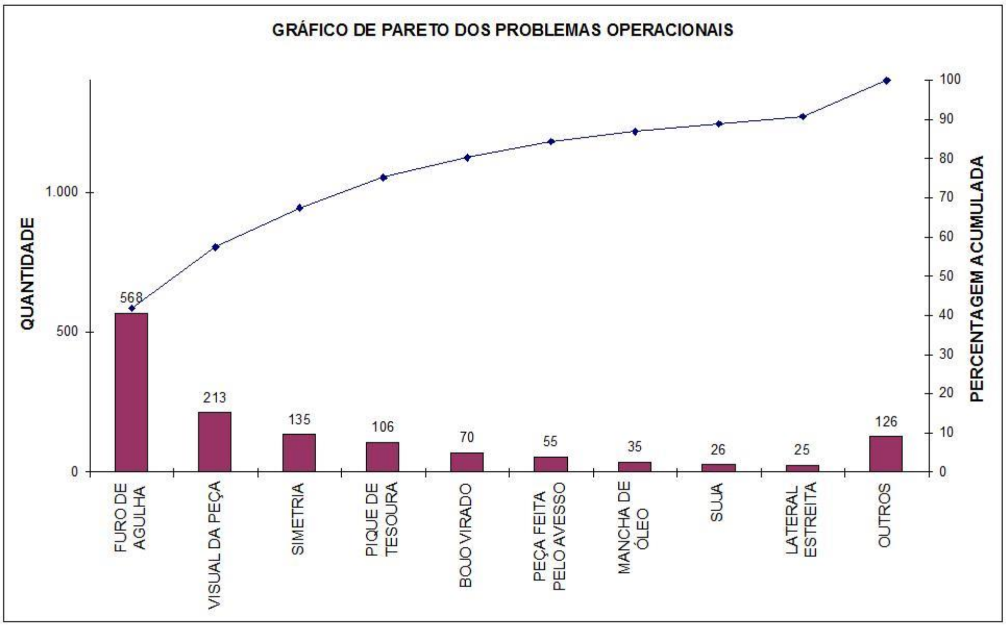
- Step 3: Add a column where the percentage values for each type of occurrence will be placed. The calculation is made by dividing the number of occurrences of a given type by the total number of occurrences in the period;
- Step 4: Finally, these percentages are accumulated in a last column, as illustrated in Chart 3 and graphically represented in Figure 6.

Table 3 - Data for the construction of the Pareto Chart

MESES / NÃO CONFORMIDADES	AGO	SET	OUT	TOTAL GERAL	TOTAL ACUMULADO	PERCENTAGEM GERAL (%)	PERCENTAGEM ACUMULADO (%)
FURO DE AGULHA	278	154	136	568	568	41,8	41,8
VISUAL DA PEÇA	38	69	106	213	781	15,7	57,5
SIMETRIA	72	27	36	135	916	9,9	67,4
PIQUE DE TESOURA	41	28	37	106	1.022	7,8	75,2
BOJO VIRADO	13	31	26	70	1.092	5,2	80,4
PEÇA FEITA PELO AVESSO	26	18	11	55	1.147	4,0	84,4
MANCHA DE ÓLEO	14	5	16	35	1.182	2,6	87,0
SUJA	4	12	10	26	1.208	1,9	88,9
LATERAL ESTREITA	7	7	11	25	1.233	1,8	90,7
OUTROS	33	48	45	126	1.359	9,3	100,0
TOTAL GERAL	526	399	434	1.359		100,0	

Source: Prepared by the authors (2019)

Figure 6 - Pareto Chart of Operational Issues



Source: Prepared by the authors (2019)

CONSTRUCTION OF THE HISTOGRAM

Steps for creating a histogram

Step 1: Sample determination;

The sample should be obtained as randomly as possible, so that it can represent the totality, as illustrated in Chart 4.

Table 4 - Determination of the sample with standard 202

Variação na Gramatura dos Tecidos				
184	188	188	191	187
180	181	188	184	182
202	191	189	187	182
185	191	179	184	180
181	187	188	179	183
196	200	183	191	185

Source: Prepared by the authors (2019)

Step 2: Amplitude calculation.

The amplitude of a numerical data series in a sample is the difference between the largest and smallest value of the data. Generally, amplitude is represented by the letter R for Range in English.

R = highest value – lowest value

Onde: R = amplitude

For example, the Highest value is 202 and the Lowest is 179, so according to the rule we have that R = 202 – 179 = 23.

Step 3: Choose the number of classes.

You must define the number of variation ranges to be posted on the chart. There is no set rule for this choice. The number of tracks should not be too large, in order to disperse the data too much, nor too small, in order to mischaracterize the histogram. The number of classes depends on the sample size. Table 5 suggests the number of classes to be used in the construction of a histogram, depending on the size of the sample available.

Table 5 - Determination of the number of classes (k)

Tamanho da amostra (n)	Número de classes (k)
Abaixo de 50	5 a 7
De 50 a 100	6 a 10
De 100 a 250	7 a 12
Acima de 250	10 a 20

Source: Peinado (2007)

Continuing with the example, as we have a sample size 30 (n = 30), 5 (five) classes (k = 5) were chosen.

Step 4: Calculation of the class range (H).

The interval between classes is calculated by dividing the total amplitude by the number of classes. For fractional values, it is recommended to round to the nearest upper integer.

$$H = R/k$$

Where:

H = range of classes

R = amplitude

k = number of classes

R = 23, k = 5, then H = 23 / 5 = 4.6 (rounding the value from 4.6 to 5 to facilitate calculations).

Step 5: Calculate the extremes of the classes.

Select the smallest value in the sample and, if convenient to facilitate calculations, round down.

To determine the upper limit of the first class, simply add the class range value (H), as shown in the formula below:

$$LS = LI + H$$

Where:

LS = upper limit of the class.

LI = lower limit of the class.

H = class range.

The limits of the other classes are calculated in an analogous way to the limits of the first class, by means of the formula mentioned above.

Classes must be mutually exclusive, i.e., the upper bound of one class is earlier than the lower bound of the next. Note the following notation:

1.45 |— 1.48 includes the value 1.45 and does not include the value 1.48.

In some situations, it may be necessary to include the last limit in the last class. In this case, the following symbology can be used:

1.93 |—| 2.01 includes the value of 1.93 and includes the value of 2.01, too.

Continuing the example and calculating the limits according to the guidance mentioned above, we obtain table 6:

Table 6 - Limits for the construction of the Histogram

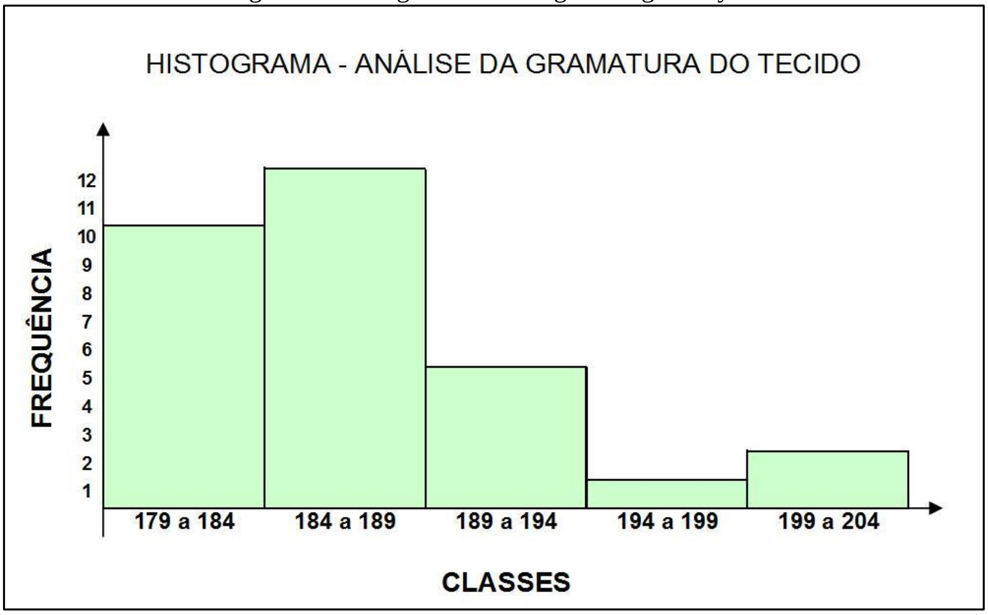
Classe	Limite Inferior	Intervalo	Limite Superior	Frequência
1ª	179	|——	184	10
2ª	184	|——	189	12
3ª	189	|——	194	5
4ª	194	|——	199	1
5ª	199	|——|	204	2

Source: Prepared by the authors (2019)

Step 6: Assemble the histogram.

To prepare the histogram with the calculated data, the graph illustrated in figure 7 is obtained.

Figure 7 - Histogram of tissue grammage analysis



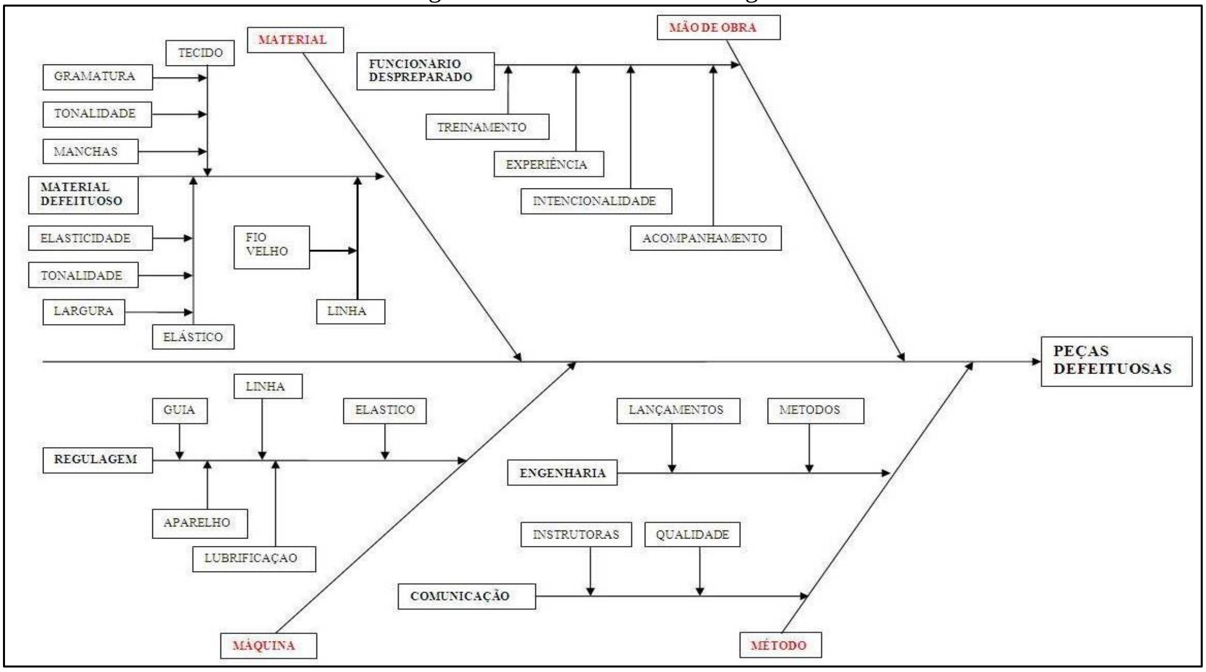
Source: Prepared by the authors (2019)

Analyzing the histogram above, it can be seen that of the 30 rolls of fabric reviewed, the vast majority are concentrated for small values of the grammage, which can generate a serious problem in the production process.

CAUSE AND EFFECT DIAGRAM

In the case study, through a brainstorming session with the participation of people in the process, the diagram illustrated in figure 8 was developed.

Figure 8 - Cause and Effect Diagram



Source: Prepared by the authors (2019)

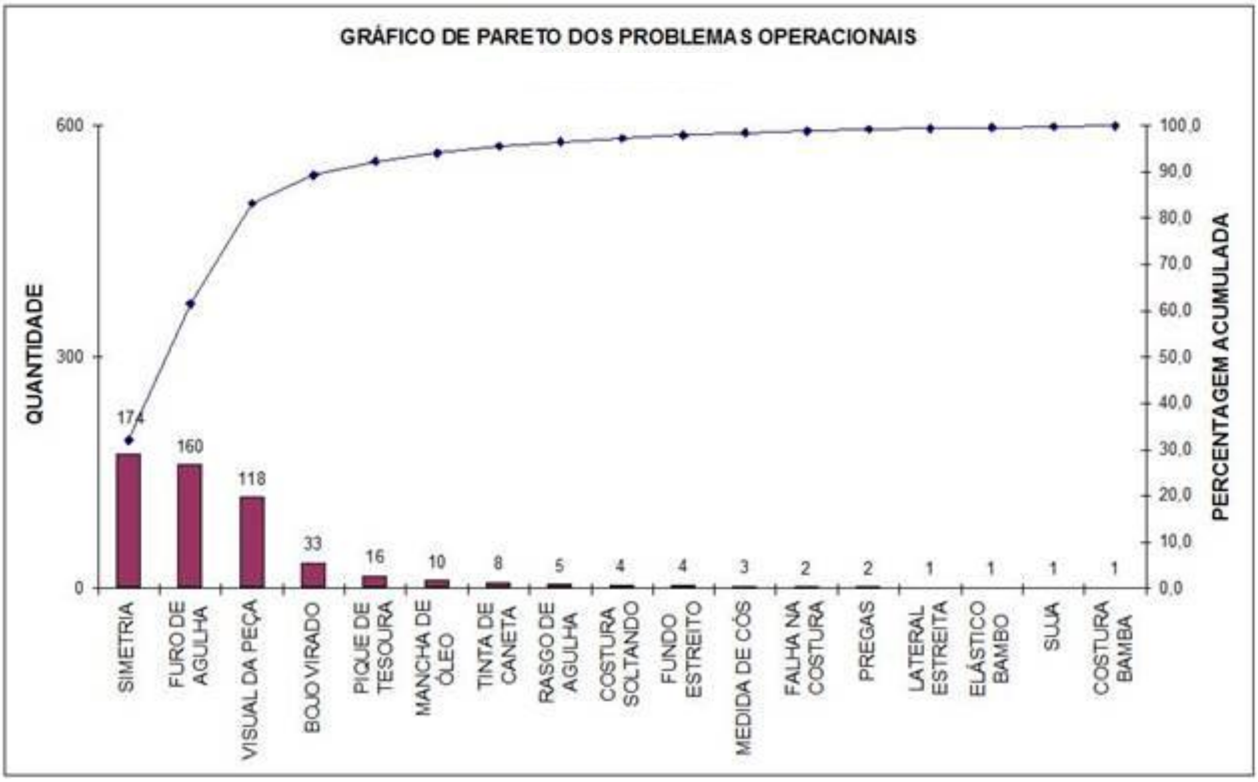
APPLICATION OF THE TOOLS WITH THE MASP METHODOLOGY

To prevent routine problems from becoming chronic, repetitive and costly for the company, this article suggests the application of a Problem Solution Analysis Methodology, better known as MASP or "QC Story" based on the quality tools in the Internal Production process, with a more specific approach to operational problems.

The first step of this work was to make a survey of the volume of non-conforming parts in order to make a comparison between the previous year and the current year. For a better visualization of the data and its variations, a Demonstration Graph tool was used, where a reduction in the volume of defective parts was found in relation to the same period of the previous year.

Although the volume of non-conformities has decreased compared to the same period of the previous year, the goal and objective is continuous improvement (kaizen) always aiming at Zero Defects. For this, another tool was used, which is Stratification, where the operational non-conformities that caused the greatest effects on "few vital" and "very trivial" problems are listed, according to the guidance of the Pareto theory and illustration in figure 9.

Figure 9 - Pareto Chart of Operational Problems



Source: Prepared by the authors (2019)

Analyzing Figure 9 and using the PDCA cycle, we have that:

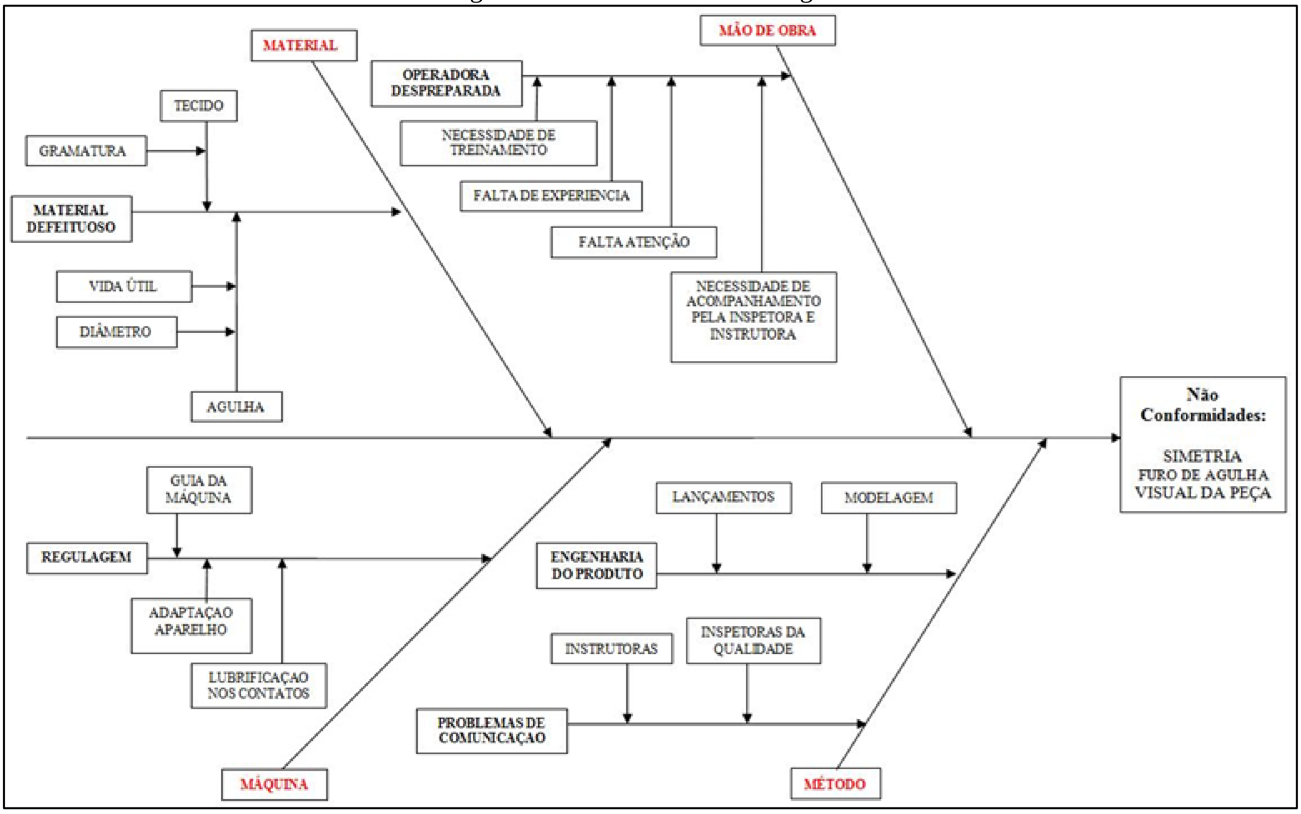
Planjar Stage (*Plan* - P)

In the first phase (identification of the problem) it is noticed that the non-conformities described as Symmetry, Needle Hole and Part Visual, together correspond to more than 80% of all accumulated non-conformities of the month.

In the second and third phases (observation and analysis) it shows us that, in view of this situation, another quality tool known as Brainstorming was used with the employees involved with the non-conformities and, through the information collected, another quality tool called the Cause and Effect Diagram was used, which is represented in figure 10.

Analyzing the *Brainstorming*, illustrated in figure 10, it is evident that unprepared operators, machine adjustment, defective material, communication problems and product engineering are the pillars of the main non-conformities.

Figure 10 - Cause and Effect Diagram



Source: Prepared by the authors (2019)

In the fourth phase (Action Plan) we have, from the information related in the Analysis and Observation phase, the following Action Plan is reached, illustrated in chart 7.

Table 7 - 5W1H for the actions

OPERADORA DESPREPARADA					
O QUE?	QUEM?	ONDE?	QUANDO?	POR QUE?	COMO?
Melhorar desempenho e o treinamento para operadores despreparadas, novatas e veteranas.	Gerência de RH e Produção	Sala de Treinamento	Imediato	Para reduzir os altos índices de não conformidades identificados na produção e não atrapalhar a época de maior volume da produção, o segundo semestre.	Desenvolver apostilas, trabalhando a motivação e a importância de "fazer certo" sempre.
MATERIAL DEFEITUOSO					
O QUE?	QUEM?	ONDE?	QUANDO?	POR QUE?	COMO?
Melhorar a qualidade do material utilizado, tanto das agulhas quanto dos tecidos.	Responsável pelo Setor de Compras e Qualidade	Realizar trabalhos junto aos fornecedores.	Até 30/jun/09	Para possuir um material de melhor qualidade e evitar não conformidades no processo produtivo.	Através de sistemas que irá pontuar cada fornecedor sobre a qualidade do material.
REGULAGEM					
O QUE?	QUEM?	ONDE?	QUANDO?	POR QUE?	COMO?
Melhorar planos de manutenção.	Responsável pelo Setor de Manutenção Mecânica	Por todas as máquinas da fábrica.	Imediato	Para aumentar a vida útil das máquinas, evitar desperdícios e retrabalhos no sistema produtivo.	Através do levantamento da situação real de cada máquina e do monitoramento constante e rigoroso das manutenções.
ENGENHARIA DO PRODUTO					
O QUE?	QUEM?	ONDE?	QUANDO?	POR QUE?	COMO?
Melhorar o atual sistema de implantação de novos modelos.	Responsáveis pelas áreas de Desenvolvimento de Produto e Qualidade	Na área de produção e desenvolvimento.	Até 15/jun/09	Para conseguir acompanhar o ritmo puxado no segundo semestre, garantindo uma melhor qualidade, redução de não conformidades e agilidade no processo produtivo.	Formando uma equipe piloto com as melhores profissionais, para aplicar os lançamentos na produção.
PROBLEMAS DE COMUNICAÇÃO					
O QUE?	QUEM?	ONDE?	QUANDO?	POR QUE?	COMO?
Melhorar a comunicação entre os setores de Qualidade, Produção e Desenvolvimento de Produto.	Responsáveis pelas áreas de Qualidade, Produção e Desenvolvimento de Produto.	Sala de reuniões	Imediato	A empresa precisa que esses setores estejam interligados, para que com a comunicação, o produto acabado tenha a garantia e qualidade que o cliente deseja.	Através de reuniões onde os envolvidos no processo, irão listar os principais problemas e trabalhar nos pontos críticos, visando o melhor para a empresa.

Source: Prepared by the authors (2019)

Do step (D)

In this stage (single phase) the objective is to block the root causes based on the action plan detailed by 5W1H, illustrated above, disseminating the plan to everyone through participatory meetings, training techniques and making sure that the actions need the cooperation of all of them.

Check step (C)

The purpose of this (single) phase is to verify that the blockade of the root causes has been successfully accomplished.

Act Step (A)

In the first phase (standardization), the standard operating procedure (SOP) is in the development phase, where the implementation of "fail-safe" mechanisms is being analyzed, which will ensure the effective blocking of non-conformities commented on in this article.

It is necessary to disseminate the SOP, establishing start dates for the new system so that it occurs in all the necessary places at the same time and by all those involved.

It is essential to work on education and training through meetings, lectures, on-the-job trainings and training manuals to ensure that the standards adopted or changes are conveyed to all involved.

In the second phase (conclusion), the MASP result is considered satisfactory, as it manages to meet the objective of the work, which consists of reducing non-conformities.

The ideal situation almost never exists, so one must be alert to the remaining non-conformities, analyzing results and seeking to solve them through the application of the Problem Solving Method.

FINAL THOUGHTS

The objectives of the work were achieved, as it was presented the use of MASP together with the application of quality tools, reducing the rates of non-conformities in the production process, describing the company and the details about the clothing industry, relating the non-conformities of the production process that are linked to quality, showing practical examples of management tools, within the context of the clothing industry and proposing improvements to the quality system.

The quality management system with its management tools, the Methodology of Analysis and Problem Solution (MASP), information on the PDCA Cycle, the 5W1H method and practical applications in the context of the clothing industry were addressed.

The practical application was based on the methodology of the case study, as previously mentioned, describing the company and presenting information about the clothing industry, defining the current situation of the company and applying the MASP methodology through the stages of the PDCA.

It is evident that the company, the focus of the study, must maintain the project, which is in its initial phase and has presented satisfactory results, reducing the volume of non-conformities in internal production and achieving the objectives.

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