

TEXTILE QUALITY MANAGEMENT: CONTROLS AND MEASURES TO INCREASE THE QUALITY OF THE PROCESSES OF A SMALL INDUSTRY

¹SANTIS, Sandra Helena da Silva de, ² MARCICANO, João Paulo Pereira, ³ SANCHES, Regina Ap.,
⁴ SANTOS, Suliany R., ⁵HELD, Maria Silvia Barros de, ⁶SCOPINHO, Carlos Eduardo Dezan

^{1,4,6}Universidade São Paulo/Universidade Nove de Julho, São Paulo (Brasil)

^{2,3} Universidade São Paulo, São Paulo (Brasil)

¹Corresponding Author Emails: s.h.santis@usp.br and s.h.santis@hotmail.com

Abstract

This study in a small textile industry and aims to evaluate and investigate the practices used in process control and measurement instruments to ensure process improvement. The aim is thus to implement process control and also the use of measurements to ensure product quality. These procedures have a direct impact on the results of productivity and product quality. The research was conducted through a case study, we intend to analyse the reality of small organization in the observation site. So we used the case study that may help elucidate a series of questions about the development of quality in the textile industry of small, verifying the possible kinds of inefficiency or improvement points unexplored. To check the controls relies on assessment, testing, analysis and monitoring of procedures and practices of the company. Moreover, implanted control strategies and process monitoring.

Keywords: System, Process, Tools, Quality Strategy..

1. INTRODUCTION

In general, companies have difficulty keeping up with market demands, innovations and transformations. How many large companies seeking solutions for small businesses that can be complied with the up needs.

Thus, the criteria for inclusion in the processes of quality control will grow as economic activities in the market. Evolve much in the composition of precision control stems investments in production processes to support the organization in its various levels of decision making.

This study addressed the tools and methodology to implement process controls to improve quality in a small business, how to improve the response fireworks small business productive. They used tools for quality management, which allowed the development of these activities while addressing methods and strategies.

This question is very important industries in the textile sector are mostly small and medium enterprises, according to the Brazilian Textile Industry Association - ABIT (2011), so there is a great need for tools to control. Thus, the implementation of quality management system in a small textile industry should have a model that fits the market.

Aim of the research identifies appropriate practices for implementing controls and process measurements to improve the quality and use tools to ensure the improvement of textile processes, the implementation of new methodological strategies that contribute to development aid in small businesses. The study contributes to an innovation in the reality of small and medium enterprises, helping to fit in such a competitive market through techniques, tools and methodologies and seeking to increase product quality.

2. REFERENTIAL

This work is justified by the importance of the textile business for the economy, which led to the search for innovative resources for industries that segment. These changes were necessary to meet the requirements of quality, economy and get quality products and processes.

The creation of a global economy boosted the search control systems and evaluation to contribute to the quality of services provided.

Technical standards, policies and procedures estimate conformity facilitates the development of new standards that provide transparent rules and reducing costs.

One of the main events, which took into account in the study of small business is the development of the field in the textile market, a key element in the search for quality as this panorama effect vindication increased by specialization, planning processes and qualification.

Pezzolo (2007) expounding on the process of mechanization of production systems said that the textile industry had an important contribution at the time, is considered a landmark in the history of industry and capitalism.

Analysing production process, industrial development which caused social changes including the acceleration of urbanization and population growth with the help of encouraging immigration by the state. Sao Paulo makes a promising market and attractive to venture capitalists. The workforce both domestically and foreign conditions provided for industrial and economic growth. The textile and clothing in Brazil undergo significant changes from the end of the 80s, with trade liberalization promoted by the government.

Carvalho and Totti (2006) argue that trade liberalization was promoted by the Brazilian government from the end of the 1980s, which caused changes in the productive chain links Brazilian textile-clothing were hit by foreign competition, causing a dislocation of production flow and demanding a restructuring.

Companies have prioritized quality and search for methods and strategies to increase their participation in a rapidly expanding market, causing an uncontrollable quest for quality in processes and services, and to monitor all these changes, organizations are ensuring and improving their processes.

According to Robbins (2003), economic shocks, technology, market competition has imposed organizational changes resulting from globalization that drove the behavior change and new attitudes by these companies, causing changes in the environment and social enterprise.

The methodology used to document the mapping process is performed using the technique to the activities of specification, analysis, process development, design and description of routine tasks. After this step we intend to evaluate the critical points, find the bottlenecks and losses.

Fu Ren et al. al. (2002 p.19) collaborate with the ideas for using the methodology of BPM (Business Process Modeling), "Dynamic modeling is a structured approach to analyze and diagnose organizational problems using dynamic models. The dynamic model of the current situation is used to analyze the business processes, and afterwards, the experimental outcomes with alternative solutions can be evaluated without implementing them in the complex reality."

This study is characterized as a case study, a qualitative research study which will be the method of field research (on-site observation). Thus for the development of quality management system, data will be collected by secondary sources (books, articles and manuals) that will provide the necessary clarifications to the problems encountered. The research will develop and expand the theme statement in order to answer the problem or to extend the field of study. The importance of micro, small and medium enterprises has been added to the fact that the role played by them in generating jobs, even in times of recession, the ability to be flexible and slight adaptation to technological change before (PUGA, 2000).

According to Silva (1999) the quality of the raw material and the conditions of the equipment and resources used in the manufacturing process of the fabric changes the quality of the product. Proceeding this idea, the determinations of the measure standard used were affected by type of feedstock and the final product being produced by the customer is one way of establishing a flow of process for production planning and further analyze the quality of information gaps (gaps).

To Hemdan (2008), statistical features such as mean, standard deviation and variance, and coefficient of variation were used to characterize and distinguish between the histograms normal tissues and defective.

The knitting that serves as the object of study in this research work with circular knitting machines and produce half weft knitted by weight in kilograms measure. The meshes are produced by interlacing yarns that knitting is called because it is the use of several needles or needles for cooking.

For Araujo, Fanguero and Hong (2000) the knitting process, the yarn count used depends on the product to be produced, the wires used for producing grids have lower twist, the main characteristics required for the knitting yarn are uniform, flexibility, elasticity and strength. In consideration of the relation of wire bonds used for the production of half-knitted items, the company uses descriptive performed by the supplier, according to information from technical documents polyester yarn sent by the client and have the features that are available in a sheet, which describes the item that is being received.

In knitting, the textured yarn is used, which is in fact undergo a change in mechanical and thermal depending on the use of the wire (Pezzolo, 2007), therefore has greater elongation. Process improvements can only be established through the control. Each control corresponds to the elimination of the causes of an undesirable outcome. One of the main problems found in the company refers precisely to establish procedures and standards for process control. To control maintenance was adopted by physical and electronic form that can maintain the necessary information to facilitate preventive maintenance, corrective and predictive means as predictive maintenance, monitoring of events and measurements (checking, and LFA calibration) in the loom machine. To determine the procedures, tasks and activities used the forms for

tracking maintenance. So-called procedures for establishing and maintaining a flow of new routines to achieve improvement and control.

According Boynton (2002) is the ability to interpret information necessary, convergent, strategic planning, and critical knowledge of the internal control system. In this sense, we observed all operations and process redesign, only after knowing the process and their specificities became possible to research and sample collection. In the study process, we used the likelihood that according to Oliveira (1999) consists of a series of element of statistical modeling that through these measures the number of cases that occur and providing the basis for that fact or assume that this phenomenon may happen.

According Santis (2014b), the control of processes based on the redesign and mapping was initiated by the resources materials which are the base for the production of hosiery item. Tests were carried out on the wire to check quality of resources, though, any yarn is supplied by the client making the request to a vendor you trust. The customer is responsible for purchasing the yarn varies with the product being produced. The company receives the raw material up and inspects the conditions under which handed the wire, each article has its own characteristics for the production, it is important to check the condition of the box and the cone storage location. By analyzing the organized structure, yet it achieves cost reduction in the development of products and services, reducing the gaps between systems and improved organizational performance, furthermore, it is considered that the tool provides the best communication between actors and greater understanding of the current processes and develop improvements that will provide the simplification or elimination of those who need changes. For this reason the focus was on the process, procedures and methods to have a control sequence.

The planning method and limitations of each procedure must be analyzed with a view to improving the quality management system and get back to the methods of the process.

The monitoring of the use made of the documents issued by the information collected. The interviews conducted in view of the needs found in this research work aiming to characterize the object of study, verify the needs of system implementation and evaluation processes. It was necessary to describe the processes existing in the company, being conducted through on-site observation.

In order to collaborate with the needs of the research done up questions about the practices included and what type of support used and what controls should be taken to get the quality of articles, and also play the needs found in a small size.

The modeling done by simple diagrams with a small set of graphics. A graphical notation which aims to provide tools for mapping process is performed in a standardized way. Having the ability to map the internal and external processes of the organization, upgrade its models according to the rules of the company and without affecting the previous specifications.

The development of the manufacturing flow diagram provided a clearer view of certain activities and facilitated the exposure of problems. The practices carried out enabled the procedure and the identification of critical points, from that, you can work directly on the needs found.

The interviews helped to find solutions to the problem and corrective actions have been implemented to ensure improvement to the process and minimize the critical points found that deserve attention because they are harming the progress.

According to Cruz (2010), the modeling of business processes is a concept that combines business management and information technology with a focus on improving organizational results is used to analyze, model, publish, optimize and control processes.

Thus, the modeling of processes is a logical sequence that provides subsidies for the development of controls, enabling visibility and tracking through its execution, analyze, model and monitor the system of business management. Continuing on this idea and the implementation of the control indicators will provide

the necessary support for the performance monitoring process. In terms of quality tools, diagram or graphical representation is a powerful tool.

Juran (1998) ponders the similarities between quality control and quality assurance, so the representation is a means of control. In each performance evaluation and compares the results with the goals and the system used to ensure quality. However, they also differ in several respects including their goals diverge. Quality control aims to keep the main monitor and evaluate performance.

According to Juran (1998), the implementation of the ISO 9000 family involves a sequence of actions such as establishing policy, setting quality objectives, design management systems, documentation of procedures and training for job skills. All these items are part of the quality system. Companies are adopting these measures in the process. This concept is emphasized in the 1994 revision of ISO 9000.

In the implementation of ISO 9001:2008, companies are using flowcharts and other devices to emphasize work in process diagnostics and find opportunities for simplification and process improvement. Metrics are being increasingly used to characterize product quality and customer satisfaction more effectively.

So become increasingly important to develop a technique that was able to detail the company's existing processes, find something that would demonstrate the routines of activities is precisely what the proposed modeling process.

For Santis(2014), the ISO 9000 family in their specifications and features provide the basis for the use of techniques and procedures that can set the level of detail required for implementation of standards. In this sense, so that the modeling technique provide the necessary subsidy for the development of work, specifications and documentation of the organization.

Meetings were held which were very enlightening for the development and improvement of the diagrams. The software allowed BizAgi demonstrate more clearly the flaws of the process enabling document all sectors.

A graphic demonstration is used to provide more detail the parameters established in the work process, by being able to demonstrate clearly and objectively procedures for greater understanding of the processes.

The production system has to have a focus on quality, productivity and inclusion in the knowledge of the employees. Thus, the company must be guided in practice controls and developing processes.

The planning of activities undertaken to effect the reorganization of processes have to take into consideration the steps required for the development of this operation.

Evaluating each step so that the changes are effected in the process and seeking compatible tools to assist in the development of process improvements.

The criteria adopted must be put in the form of analysis and weekly rates compared to control failures and defects for that, analyzed the main failure modes and defects in the Good Practice Guide System Quality Management, Portugal (2000) and presented in the company.

As Juran (1998), the performance is evaluated and compared during operations with the goals and objectives of the process. The resulting information is received and used by the operating forces. The main purpose of quality assurance is to ensure that control is being maintained. Performance is evaluated after the operations, and the resulting information bases provide analysis for both forces operating as the other agents who have a need to know about the process. On the other agents to understand functional employees, management, corporate teams, regulators, customers and the general public.

The statistical quality control should be performed on 30 samples to determine the state of process control: check for variation in stability, capacity and possible causes of nonconformity, as directed by Juran (1998).

Pearson Education, Brazil (2011) refers to the control graph as a diagram showing the relationship of a specified upper limit (LSE) and the lower limit specified control (LIE), hereby shows the stability of the

process, demonstrates the variability allows the analysis of a process by varying the pattern expected average.

According Boynton (2002) is the ability to interpret information necessary, convergent, and strategic planning and critical knowledge of the internal control system. In this sense, we observed all operations, only after knowing the process and their specificities became possible to research and sample collection.

The CPK shows the potential of the processes by means of samples, it serves to measure deployment, CPK measures the proximity between the specified limit. Below shows the item detailing the materials and methods used in the case study.

3. METHODICS AND ANALYTICAL METHODS USED

The research is characterized as a case study in the form of an exploratory and qualitative study method which is the field research (on-site observation).

According Tatim and Diehl (2004), the exploratory research aims to provide greater familiarity with the problem becoming more explicit.

The measurements for process control was performed by testing for weight loom and machine stitch length, the choice of samples made by random drawing and graphic demonstration of the results by using the Excel and MINITAB.

After numerous visits to the company concerned, in conversations with managers, information was collected by interview to assess a company's resources.

The material used was knitted article Cacharel production industry textile. The procedures were reported during the study and helped conduct the research.

The method can be defined as a set of systematic and rational that with greater safety and economy will achieve the goal, is valid and true knowledge, tracing the path to be followed by detecting errors and aiding the decisions of the researcher.

The object of the case study conducted in a small business, the segment of the textile industry in the city of São Paulo, in order to implement a quality management system supported on tools and techniques that enable standards improvements and adaptations of the processes of ISO 9001:2008. The study was characterized as an exploratory, addressing specialized bibliographic references, aiming to reliably describe the phenomena observed in textile processes this company.

In order to collaborate with the needs of the research done up questions about the methods entered, what type of support used and what controls have been made to ensure quality in the articles, and also that solutions are applied and what procedures performed in the company .

In order to implement the controls and measurements in this process and being supported in the tools and techniques that enable standards improvements and adaptations of the processes of ISO 9001:2008. The study was characterized as an exploratory, addressing specialized bibliographic references, aiming to reliably describe the phenomena observed in textile processes this company.

The Company XXZ located in Vila Maria in the northern region, has 11 employees. Operates in the textile industry producing synthetic mesh (Polyester) and natural (cotton), providing services to third parties weaving.

Founded in 2006, conquered the market since the beginning of its activities. It's a family business, and the owners are four brothers, who were already working in the same industry sector.

In 2008 they expanded their business by opening a branch that started producing the part of knitting with natural yarns.

In 2011, the owners decided to split the company's management, two of whom were responsible for the mother and the other two branch responsible for.

The company maintains a serious commitment with customers, suppliers, employees, society, investing constantly in development of production in order to provide better quality products. Observing the report presents a description of the company.

The company produces XXZ knitwear, this process involves interlacing the yarn, this being always horizontal direction (weft). This procedure is performed with the aid of needles (interlacing). The system for producing textile which are circular knitting machines, the product is knitted tubular article, using an industrial process, with looms.

The purpose of small businesses are in survival, there is no concern with competitiveness in the foreground. Ensure their productivity and take cover expenses like without worrying about the methods and procedures.

The company XXZ used as a foundation for study of system deployment and quality tools used in textile processes to the adjustments that are necessary to ensure quality processes.

Collectivity in man and machines remain enlarging an interaction process. In the pursuit of knowledge and the subsequent development of mankind, the socio-historical context has been related to mechanical development processes.

The relationship with environmental development of production processes that are interrelated to the problems and implications of human development. With this relationship appears to get better idea of the quality of products and services is a way to make the organization more competitive in the market. Thus it is important to develop a plan for improvement, suggesting corrections and assisting decision making.

4. RESULTS

We conducted a study focusing on the activities and processes of the company, to begin investigations, interviews were conducted with managers to survey priority needs.

Second, the managers the company has no control system or quality, which often leads to wasted time and rework.

Second: "I often request information during a meeting or a negotiation with suppliers or customers, who now have to everything I'm doing to give information or consent to receive the raw material."

In view of the report, we identified the precision controls that provide clear information on the procedures to be performed. It can be noticed that there is a formalized system, and for this, it was deemed necessary to analyze the production system.

To identify the processes and needs held the check list for diagnosis.

Diagnostic process:

- Process incoming goods without control;
- Lack of information to receive raw material causes delays in the delivery of the goods, as it needs authorization to discharge the wire;
- Raw material inspection or has not received any verification;
- No description of responsibilities or tasks defined activities have no description or documentation, which causes rework and idleness;
- Production processes: are not documented;
- defects or failures of processes are not documented;
- Defects in the products has no control;
- Lack of information on maintenance of machines;
- Production process does not have a schedule of equipment, causing idle or waiting for equipment;
- Process stock has no control causing lack of raw materials or purchases in excess.

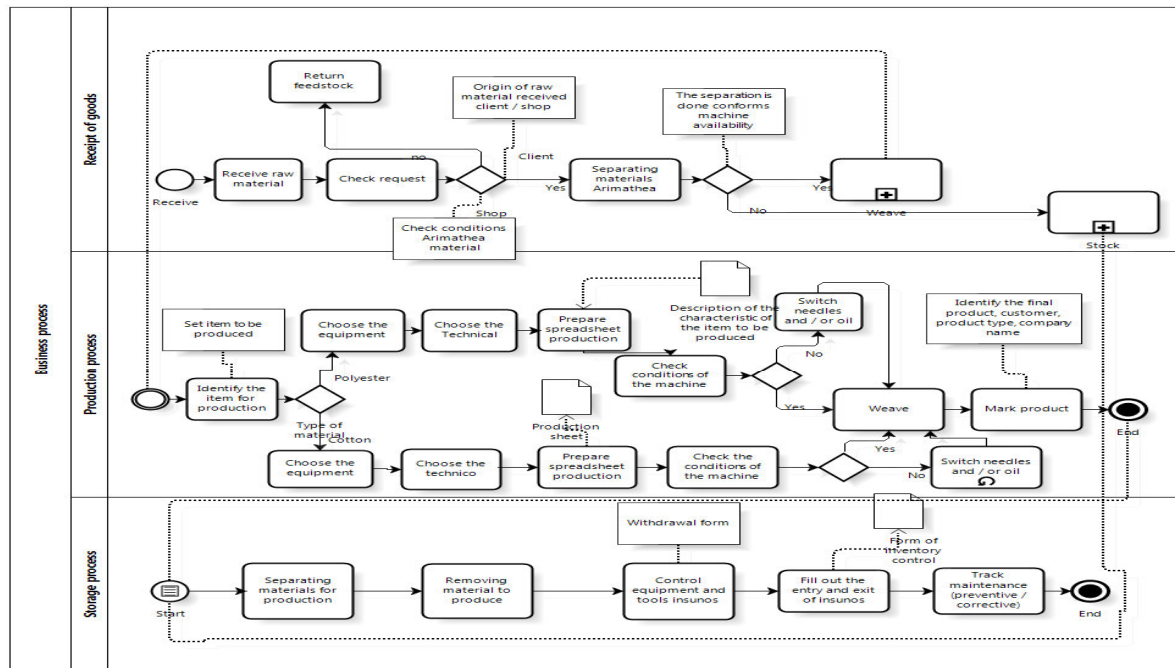
This step enabled the development plan established by monitoring the execution of improvement actions and the planned corrective actions.

For identification and documentation of processes elaborated a plan in which, could follow the procedures that are being developed and know the purpose of each step. We developed a plan containing the steps for checking the controls and indicators, this work process as defined description:

- ✓ Check the controls and indicators;
- ✓ Assess the needs of controls;
- ✓ Check the availability of technical instructions for manufacturing orders to be initiated;
- ✓ Check processing sequence of the manufacturing orders;
- ✓ Collect information to control the motion controls and indicators.

After, in the planning phase, the procedures of work it was found that the company has no quality control. Thus, to meet these needs, we elaborated a plan for the development of controls and indicators that could help the company.

Was to hold the lease for quality control and also monitor the production system of the company. Thereafter, prepared by the description of the processes and the flow of the enterprise system (Figure 1).



Powered by bizagi modeler

Figure 1-Mapping processes

The process flow presented as a proposal developed after mapping carried out in the company, in the case of a small business does not have a diagram to show the flow of their processes.

The controls are essential for the proper functioning of any process within organizations. The company in question did not exist some of these controls, just had to collect data, and these were not used for any type of analysis, as they should be.

Needed is a general survey of the entire system, which allowed the mounting of a scorecard and cue controls with new indicators. To make the crossing of the data, and thus build a policy-based information for decision making.

For Deming (1990), today's problems include maintaining the level of quality of the product currently produced, production control to avoid greatly exceed the actual level of immediate sales, production controls seek to ensure product quality by reducing the cost processes.

On these occasions, correct the flaws as soon as possible is extremely important, though somewhat late. The dissatisfaction and customer dissatisfaction can lead to irreversible losses. The control advisor to find fault and consequently an increase in the quality of technical development with the pursuit of continuously improving it (Robbins & Coulter, 1999).

The processes of production system suited to the requirements and provide information necessary for their management.

The purpose of conducting the tests was to meet the requirements of the standard rules of the textile sector and still get control parameters that are able to measure production processes.

4.1 Measuring

For the development of tests for quality measurement performed a series of measurements. In the first series of tests was conducted to determine the title of the thread for this, we used the unit of analysis measurement (ASPA) as shown in figure 2.



Figure 2 - ASPA - Apparatus for measuring the yarn count

The procedure was performed in Brás SENAI with the help of coaches and teachers. For this test was used conicais 10 dtex polyester yarn 75/36 lots of 366, the reasons for the tests conducted was used ABNT NBR 8427 and ABNT NBR13214.

According to ABNT 8427:1984, the standard measurement to express the parameters of the yarn count in various textile materials expressing the titles on the system TEX.

ABNT 13214: 1994, refers to determining the yarn count, in this case dtex (grams per 10,000 meters) which was later transformed into tex (grams per 1000 meters).

In the procedure puts the wire in the machine ASPA (electronics), which is programmed, this measurement was required to schedule 100 laps, the equipment is scheduled for laps, each lap equals 1 meter, drive the machine until his arrest has a total of 100 meters of wire. For this measurement is placed conicais 10 and the process was repeated three times in total with a total of 30 samples each sample. After collecting the sample held in an analytical balance weighing to calculate the yarn count.

This calculation was based on samples collected are presented in the following table 1.

Table 1 - Title Wire

Tests of Title wire in ASPA						
1	0,8625	0,8575	0,8545	0,851	0,8545	
2	0,8515	0,8675	0,8675	0,851	0,8575	
3	0,8535	0,855	0,8505	0,8485	0,864	
4	0,859	0,86	0,865	0,8615	0,8685	
5	0,8795	0,862	0,858	0,8685	0,851	
6	0,8585	0,8545	0,863	0,861	0,8545	
	0,86075	0,85942	0,85975	0,85692	0,85	Average
					0,85	Average
					0,0056569	Standard Deviation
					0,0055378	Standard Deviation Middle
					4,728	Variance

Table 2 - Features Article

M03	M08	M10	M12		
14,5	15,5	16,0	15,5	LFA	
75/36	75/36	75/36	75/36	Yarn count	
114	98	106	100	Dtex	Tex
115	96	110	101	85,90	8,59
116	99	105	101		
115	96	104	100		
116	97	107	102		
115,2	97,2	106,4	100,8	Average	
0,83666	1,3038405	2,3021729	0,83666	Standard Deviation	
0,64	1,04	1,68	0,64	Standard Deviation Middle	
0,56	1,36	4,24	0,56	Variance	

The sample analysis resulted in the title of the thread presented in the graph which shows the variation are obtained and to calculate the expression of the yarn count used as the arithmetic mean.

Table 1 shows the variation of the weight of the yarn being from the same lot variation has presents a deviation measures presented the average value is 0.8590.

The yarn count was made based on the formula used in which the average of the measurements.

Title = (KC) / P (average of the measurements x 10,000) / 100 = (0.8590333 x 10,000) / 100 = 8590.3333 / 100 = 85.90

In this sample have the title in 85.90 dtex to transform in tex uses the formula:

tex = Dtex/10 = 85.90 ÷ 10 = 8.59 tex

In the next test, the stitch length retreated 1 meter of fabric per each machine randomization and samples were cut out for measurement.

Another important test is the weight of fabric weight per unit area of a fabric, the grammage can be obtained in two ways dividing the weight by the sample area or by means of graduated scales for weight measurement, the sample should be withdrawn for one sample and then cuts must weigh the sample yielding the weight means weight per weight value mesh per square meter, and for calculating the weight uses the formula:

= Weight g / m ⁽²⁾ = P (sample weight): A (sample area)

The data were grouped into a table to provide a basis for calculations compatible with the needs of control. Data were willing to clearly monitor the variation in the measurements, and for this, we used the arithmetic measures.

Oliveira (1999) states that the data reduction procedures are used to reduce and simplify in unit values and that these procedures involve research processes of representation and application logic. Data were described using the software MINITAB and Excel, which helped greatly in the preparation of charts.

To measure the process capability (CPK) use to weight of fabric weight per unit area of a fabric, the grammage test performed on samples in random machines loom providing process capability index for machine.

Average Statistics:

$$\bar{x} = (x_1 + \dots + x_2 + x_3 \dots x_n) / n = 1 / (n) \sum_{(i=1)}^n x_i$$

Standard Deviation:

$$S = \sqrt{1 / (n-1) \sum_{(i=1)}^n [(x_i) - (\bar{x})]^2}$$

Variance:

$$\text{var}(x) = E((x-\mu)^2) =$$

In carrying out the capacity test was used to test parameters and requirements Juran the AFNOR 07101 retired 30 samples divided into six groups, these were weighed each group.

To perform the calculation of capacity used to weighted average of the weights, it chose to say that an article type of fabric (mesh Cacharel, 100% polyester). Only four machines were weaving this article which is called: M 03, M07 and M10 and M12. Each loom is set to a type of article or customer, for this reason has different weights to achieve the measurement parameters pick up the item had the greatest number of machines have a base for producing reliable sample.

M03 characteristic of the machine that has the following characteristics Mayers, S40, 3400 needles, diameter 34 "inches, fineness gg 28 and 72 feeders.

The M07 machine loom Paolo Orizio, diamentreo 34 "inch finesse 28gg, 2940 needles and 82 feeders.

The M 10, the machine Kwan Yu loom, model KL/60B, diameter 34 "inches, fineness 28 gg, 72 feeder needles and 6000.

The sample M12, shows the results of PAI LUNG loom machine, model PL-XR2B, diameter 30 "inch finesse 28gg. 2650 needles.

The graphics controls were used to determine the degree of stability of the production process. The capacity estimation provides control parameters. Note that the data show an estimate, a test measurement and appropriateness for parameterization.

The graphics controls (Figure 4) were used to determine the degree of stability of the production process. The capacity estimation provides control parameters. Note that the data show an estimate, a test measurement and appropriateness for parameterization.

In figure 4 it is observed that there is no concentration measurements due to the amount of sample which occurs at some point repeat steps 115 and 116 indicates that the probability of repeating the grammage is between those measurements. Furthermore, the graph shows that the process is out of control and is unable.

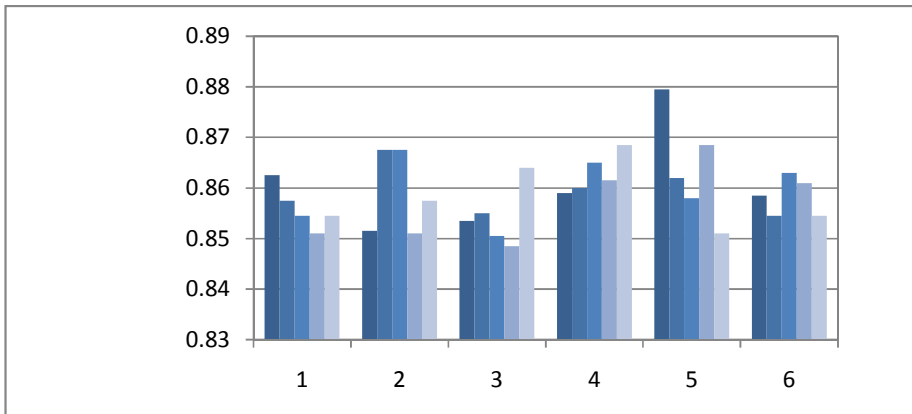


Figure 3 - Graph of the yarn sample variation

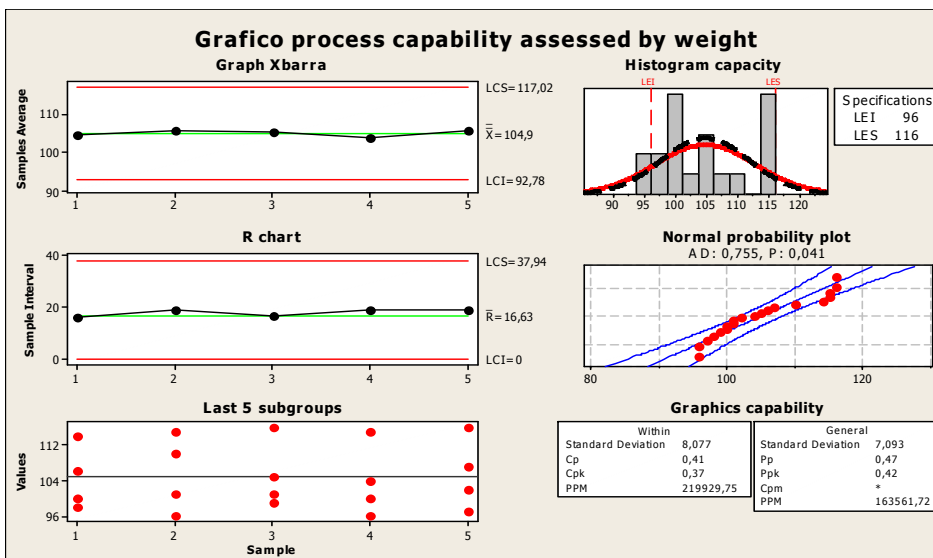


Figure 4 - Chart process capability achieved by weight

5. CONSIDERATIONS

The work developed through the case study of a small textile industry had its deployed and tested procedures, although there is still resistance compared to standard controls can say that this running.

The field survey provided information gathering, observation and evidence for the development of graphical demonstration of the processes and parameters to control. In the course of this work show that the controls proposed for managers to better elucidate the production process.

A major difficulty for continuing improvement process becomes: convince managers that although the process has satisfactory results in financial term, does not meet the requirements for a quality certification. Improvements are needed to enhance performance and provide a reduction in rework processes.

In the situation presented itself makes clear that the implementation of improvements has a focus on quality and preparation for implementation of a quality system that would make the company more competitive in the market.

By establishing standards and procedures standardizing business processes aims to the practice and give a rationale new routines and they are to be transmitted by a physical document and not just tacit knowledge (definitions apply tacit knowledge assimilated experience by experience).

When it refers to the transmission of knowledge, it is important to remember that the two types, both as tacit knowledge explicit (it is understood by explicit knowledge, knowledge acquired in formal education settings: schools, colleges and universities), are valid for the company's development.

The data suggest that controls the processes of the production system are essential for organizational improvement, in general, one can observe that the company tends to be more organized when there is doubt about the task to be performed.

From the arguments used to establish the need for change, to indicate priorities. In this sense, the quality tools used in the process of implantation show if appropriate for the system. Each tool used control measures enabled system.

Despite the fact that the quality tools used in different phases formed, all sharing a common purpose, to insert quality in the system. Through digital made up the record of the measurements to ensure that information is available for later comparison. It is now, follow the procedures performed system maintenance, perform new tests to indicate the monitoring highlighting sequences of tasks that are performed.

Thus, for the assessment of the results it is proposed the use of statistical modeling and verification of the performance indicators placed in the system. Measurements shall be made after the expiration of three months of implementation of the management system.

While still presenting some inconsistencies can be said that the implementation results have provided information to managers on the procedures developed in the company.

Provided a map of the productive processes, the division of labor and organization chart. Deploying put inspection controls, forms with adequate information and a flow of routines also implemented the documentation of the beliefs and values of the company quality policies and tests for measuring system, in this context it can be said that there was an increase in terms of processes and quality controls.

REFERENCES

- ABIT – Associação Brasileira de Indústria Têxtil. Fonte de internet disponível em: <http://www.abit.org.br>, obtido em 11/09/2011, às 22h: 10 minutos.
- ABNT NBR ISO 8427(1984) Emprego do sistema tex para expressar titulos têxteis-Procedimento.
- ABNT NBR ISO 9000(2005) Fundamentos de sistemas de gestão da qualidade.
- ABNT NBR ISO 9001(2008) Sistemas de gestão da qualidade - Requisitos.
- ABNT NBR ISO 13214(1994) Materiais Têxteis – Determinação do Título do fio- Metodo de ensaio.
- ADANUR, Sabit and ALLEN, Brian.(1995) First results on the effects of ISO 9000 in the US textile industry .Textile Management and Technology Department, Auburn University, Alabama, USA, Benchmarking for Quality Management & Technology, Vol. 2 No. 3, pp. 41-52, traduce do author.
- ARAÚJO, Mário de, FANGUEIRO, Raúl, HONG, Hu.(2000) Têxteis Técnicos – Materiais do Novo Milénio – Vol. I: Visão Geral. Braga.
- Association Française de Normalization, Paris.NFG 07.101 (1997).*Longuer de fil absorbée*. Paris, 1985.
- ASTM D 3822-97– Standard Test Method for Tensile Properties of Single Textile Fibers, Book of Standards Vol. 07.02, pp. 128 - 137.
- ATP - Associação Têxtil Portuguesa. Fonte de internet disponível em: <http://www.atp.pt>, obtido em 30/08/2011, às 24h: 36 minutos.
- BOYNTON, William C. &etal. (2002).Auditoria.São Paulo: Ed. Atlas.
- CAMPOS, Vicente Falconi (1992) Controle da qualidade total. Rio de Janeiro: Fundação Cristiano Ottoni.

- _____ (2004). Gerenciamento da Rotina do trabalho do dia-a-dia. Rio de Janeiro: Fundação Cristiano Ottoni.
- CANABRAVA, A.P. (2005) História Econômica: estudos e pesquisas, São Paulo: Hucitec; UNESP; ABPHE.
- CARVALHO, Ailton Mota de & TOTTI, Maria Eugenia(2006). Formação histórica e econômica do Norte Fluminense. Rio de Janeiro: Garamond.
- CRESSWELL, Lesley(2004).Understanding Industrial Practices in Textiles Technology. United Kingdom: Nelson Thornes.
- CRUZ, Tadeu (2010) Bpm &bpms: business process management & business process management systems, 2 ed. Rio de Janeiro: Brasport.
- DEMING, W. E.(1990). Qualidade: a revolução da administração. Rio de Janeiro: Marques Saraiva.
- D. Lipovatz, Stenos F. and A. Vaka(1999)National Technical University Athens, Greece, International Journal of Quality & Reliability Management, Vol.16 nº 6, pp. 534-551.
- DIEHL, Astor Antônio e TATIM, Denise Carvalho (2004). Pesquisa em ciências sociais aplicadas: métodos e técnicas. São Paulo: Prentice Hall, pp. 47- 65.
- D. Lipovatz, Stenos F. and A. Vaka(1999). National Technical University Athens, Greece, International Journal of Quality & Reliability Management, Vol.16 No. 6, pp. 534-551.
- FU REN, L. MENG-CHYN Y. and HUA YU, P. (2002) The generic structure for business process modeling.Business Process Management. Journal; v 8, 1, ABI / INFORM Global, p. 19.
- GODOY, Arilda S.; ALVES, Mário A.(2004) Pesquisa Qualitativa baseada em Entrevistas. V Seminário de Metodologia FCECA – Método Qualitativo – 1º. Semestre, São Paulo.
- Guia de Boas Práticas de Gestão da Qualidade (2000). Portuga: Editora Associação Portuguesa de Têxtil e Vestuário.
- HEMDAN A. Abou-Taleb, AyaTallah M. Sallam(2008)On-Line Fabric Defect Detection and Full Control in a Circular Knitting Machine; AUTEX Research Journal, Vol. 8, No1, March.
- JURAN, Joseph M. and GODFREY, A Blanton(1998). Juran's quality handbook, 5th ed. p. cm.Previous eds. published under title: Juran's quality control handbook. Include indexe ISBN 0-07-034003-X, 1998.
- _____ Controle da Qualidade (1991). São Paulo: 4º Edição – Editora Makron.
- _____.; tradução de Nivaldo Montinelli Jr.(2004). A qualidade desde o projeto: novos passos para o planejamento da qualidade em produtos e serviços. São Paulo: Ed. PioneiraThomson Learning, p. 15.
- KWASNICKA, Eunice L. (1995)Introdução à Administração. 5ª. Ed. São Paulo, Atlas.
- LIN, FU-REN et al. (2002). A Generic Structure for Business Process Modeling.Business Process Management Journal, Vol. 8 No. 1, pp.19-41.
- MARTINS, Petrônio G. & LAUGENI, Fernando P.(2005) Administração da Produção. 2ª Ed. Ver. Aum. e Atual., São Paulo: Saraiva.
- MAXIMIANO, Antônio César A.(1992). Introdução à administração. 3ª ed., São Paulo, Editora Atlas.
- OLIVEIRA, D. P. R. (2004).Planejamento Estratégico: conceitos, metodologias e práticas. 20. ed. São Paulo: Atlas.
- OLIVEIRA, Silvio L. (1999) Tratado de metodologia científica: projetos de pesquisas, TGI, TCC, monografias, dissertações e teses. 2ª Ed. São Paulo: Pioneira.
- PARMENTER, David (2007). Key performance indicators: developing, implementing, and using winning KPIs. Ed.John Wiley & Sons, Inc.: New Jersey, USA.
- PEZZOLO, B. Dinah(2007). Tecidos: Historia Trama, Tipos e Usos. 1ª Ed. São Paulo: SENAC.

- PORTER, M. E.(1989).A vantagem Competitiva das nações. Rio de Janeiro: Campus.
- PUGA, F.P. (2000). Experiências de Apoio às Micro, Pequenas e Médias Empresas nos Estados Unidos, na Itália e em Taiwan. Textos para Discussão n. 75. BNDES. Rio de Janeiro, 15 fevereiro.
- ROBBINS, Stephen & COULTER, Mary (1999) Administração. 5ª Ed., Rio de Janeiro: Prentice-Hall do Brasil Ltda.
- ROBBINS, Stephen Paul (2009) Fundamentos do comportamento organizacional; tradução técnica Reynaldo Marcondes. São Paulo: Pearson Prentice Hall.
- SANTIS, S. H. D. S., Hoelz, J. C., Marcicano, J. P. P., dos Santos, S. R., & Romani, M. (2014 a). Modelagem De Processos Para Melhoria Dos Controles Na Gestão De Uma Empresa De Malharia De Pequeno Porte. *CONTEXMOD*, 1(2), 15.
- SANTIS, Sandra Helena da S. & et.al (2014b) Statistical Modeling in the Standardization of Production Systems. *American International Journal of Contemporary Research*, Vol. 4 No. 1; January, pp 118-130
- SILVA, Jose Felisberto Cardoso(1999). Malharia Circular- Controle da Qualidade no processo de fabricação. Rio de Janeiro: SENAI/DN, SENAI/CetiQ, CNPq, IBICT, PADCT, TIB, 105p. (Serie Tecnologia Têxtil).
- VALLE, Rogério & OLIVEIRA, Saulo Barbará, et al (2012). Análise e Modelagem de Processo de Negócios foco na notação BPMN (*Business Process Modeling Notation*). São Paulo: Atlas.
- VERGARA Sylvia Constant (1998) Projetos e relatórios de pesquisa em administração. 2. Ed. São Paulo: Atlas.
- TAKASHINA, N. T. & FLORES, M. C. X.(1997). Indicadores da qualidade e do desempenho. Rio de Janeiro: Qualitymark.
- WURFHORST, Burkhard, GRIES, Thomas, VEIT, Dieter(2006). Têxtil technology. Munich: Hanser.