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FURNITURE INDUSTRY IN TURKEY DUE TO PRODUCT AND PROCESS ADDITIONAL WORK OR THE SCOPE OF THE METHOD

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ABSTRACT

The primary objective of work study techniques to increase productivity and conduct in this context is to reduce costs. However, the result of work-study techniques not only intended to provide a benefit to the company, but also to the customers. Before starting work study techniques in this regard, the firm gaze customers, satisfaction and dissatisfaction, and general thoughts were asked to learn. According to customers' concerns and expectations about the company conduct various analyzes were thought to be more accurate and precise. Bursa Inegol operating loss for medium- and large-scale furniture enterprises to increase their productivity and reduce the time for that company owners and managers' satisfaction in this respect, discontent, customer trends, objectives, expectations and ideas for finding of this study is to assess the lost time. Accordingly, the results of the analysis of a simple but highly effective technique for the diagnosis of the problem and cause-and-effect diagrams, Pareto and analyzed.

Keywords: Statistical process control, Furniture industry, Work-study, Productivity, Loss of time.

INTRODUCTION

Businesses to increase productivity in order to compete with each other in a globalizing world, lowering production costs, pre-calculation of costs between competitors is of great importance to

be able to fight. Production costs must be calculated in advance in order to calculate the standard time. Turkey is an important part of the furniture sector in the economy, and surplus of enterprises in the sector, the competitive environment brings. The intensive competition in this sector the low cost and the efficiency of the products that require high. As a result of the implementation of Statistical Process Control Technique and be lowered to improve the efficiency of cost and wastage, is an advantage for businesses in an environment of intense competition. Particular, to lower costs, reduce wastage in production situations or problems as a result of the use of these techniques is determined at points it is possible to solve the problem.

The work on projects important to the elimination of errors. However, all errors be eliminated. Therefore, it is necessary to determine the order of priority. Pareto analysis to determine the classification and classes that, it contains the value of which is intended for further observation. Pareto analysis is used as a means of determining problems in the industry today. Managers and workers to identify the causes of problems, or problems, Pareto analysis, the most important benefit (Gursakal, 2007).

Pareto analysis, routine used in the main separation method or priorities. This technique, with the help of a graphic display of the event and encountered the problem or issue would drama has focused attention on the most important reason, and because it helps in the setting of priorities is available in almost every area (Demirbas, 2010).

It is often difficult to decide. Pareto analysis of the data by classifying simplifies decision-making. Pareto charts for such classification is used. Pareto analysis 19 The Italian economist and sociologist Vilfredo Pareto century (1848 - 1923) was developed by. Which will later be known as the principle of their own for the first time revealed, the economic content (QCC., 1984).

Pareto principle in the literature "80-20", "90-10" rule or the "70-30" rule is also. Also known as ABC analysis, Pareto chart, the main distinction is the usual method, or used in the identification of priorities. Pareto diagram, which is less important causes of a problem, an important reason is used to distinguish a bar diagram. Pareto diagram is used to determine the problems, at the same time is important for team work. Pareto diagram description of the problem and to improve the level of which is an important tool that can be used to measure (Anonymous, 2012).

All of the possible errors in the presence of a product cannot be said to have the same degree of importance (Kobu, 1987). Analysis cost and a method that can be used to detect errors (TSE., 1993). Important reason for the different number of Pareto analysis, a technique used to separate less important than the reasons. This technique with the help of a graphic display of the event or issue of the problem encountered and focus your attention on the most important reason other than because they help determine the priorities of the economy and is available in all areas outside.

Especially when determining the quality control and quality improvement programs which cause problems on larger errors can be detected easily by means of this technique to have Percent (Ishıkawa, 1982).Benefits of Pareto analysis are as follows (Bozkurt, 1998):

• Problem determination on the factors with the highest degree of importance
• A list of problems, for each of the following error numbers to sort and identify the causes of
• Create a table in order of importance
• Determine the number of total error in the list
• Each problem is to calculate the rate of% per cent showed
• Will any team on the road, or a merge operation to take a joint decision.

The purpose of the Pareto chart, types of defective parts and the error in determining the most productive areas of quality control elements guiding the intensification of labor, and to take appropriate measures to ensure that appropriate decisions given (Egermayer, 1988). To reduce the tolerance limits for products consisting of a large number of complex, Pareto chart is a simple but effective analysis applied to the drawing vehicle of this issue (Kobu, 1987).

Using the Pareto Diagram, Cause-Effect Diagrams can be Very Helpful in Solving Problems

Cause-and-effect diagram, the problem and the problem is a graphical representation of the relationship between the fundamental reasons (Anonymous, 2012). Uncovered a problem visually is an effective method for organizing and saving reasons (Top, 2009). A cause-and-effect diagram to show all the reasons that affect the results and conclusions are made. After identifying the problem is brainstorming about the people gathered together, and thus tries to make possible causes of the error. The right side of the diagram results or problems on the left side is written reasons (Ozcan, 2006). Diagram to resemble the spine of a fish "Fishbone Diagram" is also called the (Yucel, 2007). Causes of the problem with this method investigated in a systematic manner.

By Ishikawa cause-and-effect diagram was developed in the early 1950s. Referred to as the fishbone, diagram because of the views. Method, and then the formation of an undesirable event or a problem occur when the factors identified. Introduce a systematic approach to investigate the causes of the event of interest. The main reasons are divided into five or six sub-categories and each of these categories are also divided into sub-causes. The process continues until all the factors are listed in the.

After editing process is started on the diagram to the control of the main reasons the most important, and therefore it tries to reduce the error. May be too costly to, address all causes than on the extent to which the recovery of which will be difficult to detect due to some reason(Bircan and Ozcan, 2003).In this context, there is a lot of work before the production of the enterprises, mass production flows due to various reasons which cause disruption of production or a decrease in

productivity was to determine the factors that affect negatively. Determined to shed light on the operation of these factors were revealed.

MATERIALS AND METHODS

Material

In the study of Bursa Inegol, taking into account the medium-and large-scale enterprises in the furniture business owners and managers of 76 was conducted randomly.

Furniture consists of enterprises as the scale of the survey questions posed. Overall satisfaction questions, lost time due to product characteristics, process or time lost due to the method, a total of 31 relevant answers to the question have been investigated.

In general, the content of the questions in the questionnaire on behalf of the furniture enterprises to increase productivity, reduce lost time on this issue, and for that company owners and managers of satisfaction, dissatisfaction, customer trends, objectives, expectations and were asked to determine the lost time in order to find out their thoughts.

Method

First of all lost-time furniture enterprises Pareto analysis for determining the results of a survey that is done then subjected to the rule of 70-30 form part of a survey of 70% and 30% satisfaction factors needed form part of the analysis has been done on the factors of dissatisfaction. As a result of this analysis, Pareto analysis dissatisfaction within the scope of the factors determining the cause-and-effect diagram of possible causes that may lead to dissatisfaction constitutes the essence of the method of brainstorming tried to determine first the cause imaginable. For this survey regulate the group, together with the owners and managers of firms in the enterprise survey made during the brainstorming session. Possible causes are determined, with the approval of the common causes are determined.

In this study consisting of three, main headings. Lost time against company officials survey Pareto analysis to determine the factors in terms of dissatisfaction, respectively, according to the results cause-and-effect diagrams are interpreted.

RESULTS

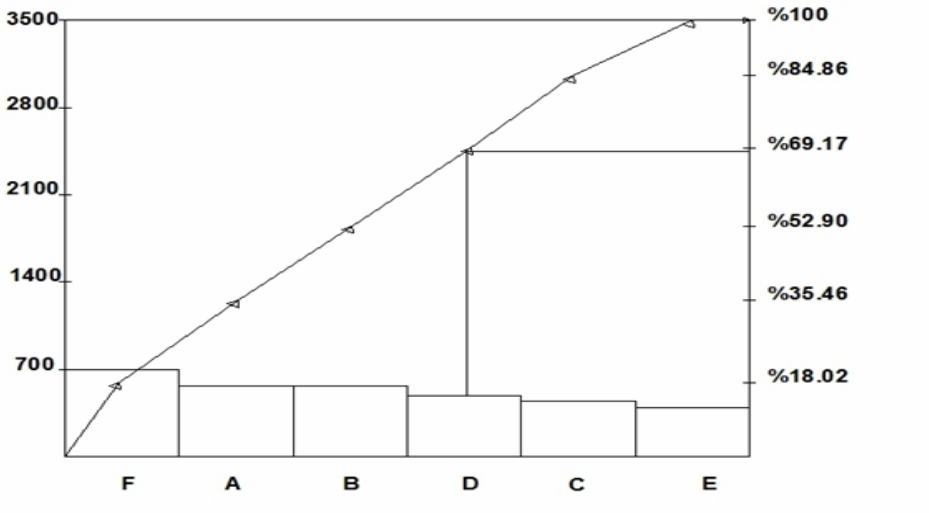
Overall satisfaction with a score of firms and managers within the scope of this study question was raised about 6. This code Pareto analysis data, other data shown in table (1) collectively.

Table-1. Pareto analysis of the data, the overall satisfactions score.

Code	When questioned, the criteria	Score	percent	Cumulative (percent)
F	Company employees, the level of product knowledge	620	18.02	18.02
A	Whether or not the products are delivered on time	600	17.44	35.46
B	Products have been taken into account on the basis of customer complaints	600	17.44	52.90
D	Product price	560	16.27	69.17
C	Product quality	540	15.69	84.86
E	Resistance of the package	520	15.11	100.00
	Total	**3440**	**100.00**	**-**

Pareto diagram is drawn in the light of this information. Pareto diagram formed by these values as shown in Fig.1 below.

Fig-1. Overall satisfaction rating Pareto diagram



A-Whether or not the products are delivered on time

B-Product basis have been taken into consideration customer complaints

C-Product quality

D-Product price

E-Packaging durability

F-Company employees, the level of product knowledge

As a result of the Pareto analysis dissatisfaction level of 70% of product information for company employees (F), whether or not the timely delivery of products (A) and the product taken into consideration on the basis of customer complaints (B) has been determined that a subject of a review process, and the priority of these three items should be started increased. Pareto analysis is

also the product price (D) in 70% of language, although rarely present in this issue because there was no need to examine within this study.

F is the maximum dissatisfaction Company authorities, customers for factors A and B coded negotiation is made again, these factors helpful in which their phases are asked. Cause-and-Effect Analysis of the possible reasons for this is to learn (fish bone diagram) was utilized. Dissatisfaction with the highest level of information the subject of company employee's cause-effect analysis of the product is provided in Fig.2.

Fig-2. The Company product information on the level of employees' Cause-and-Effect diagram

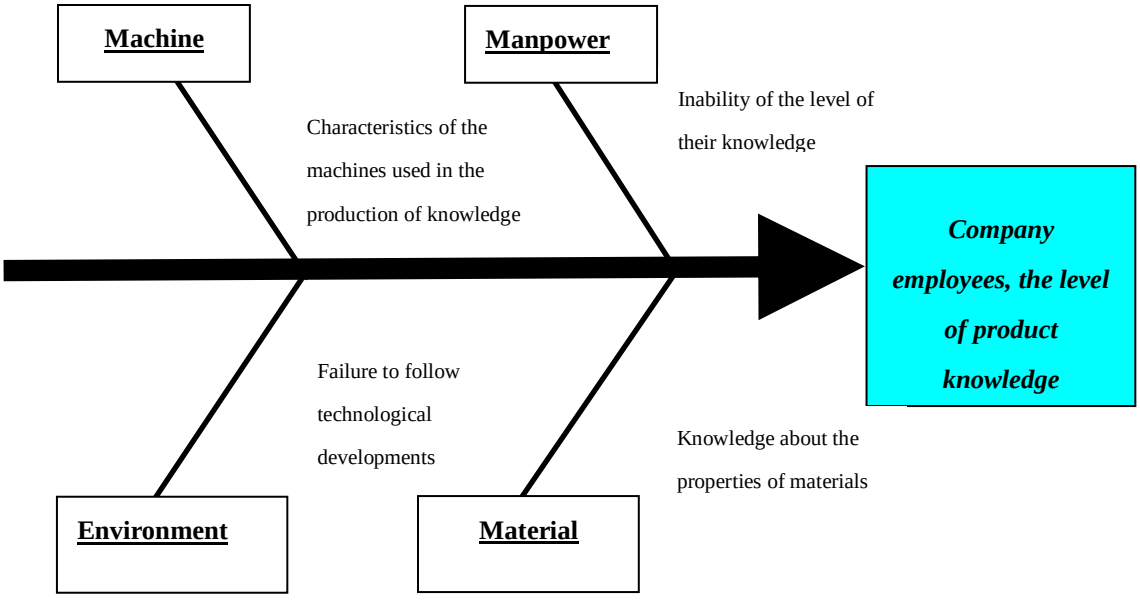
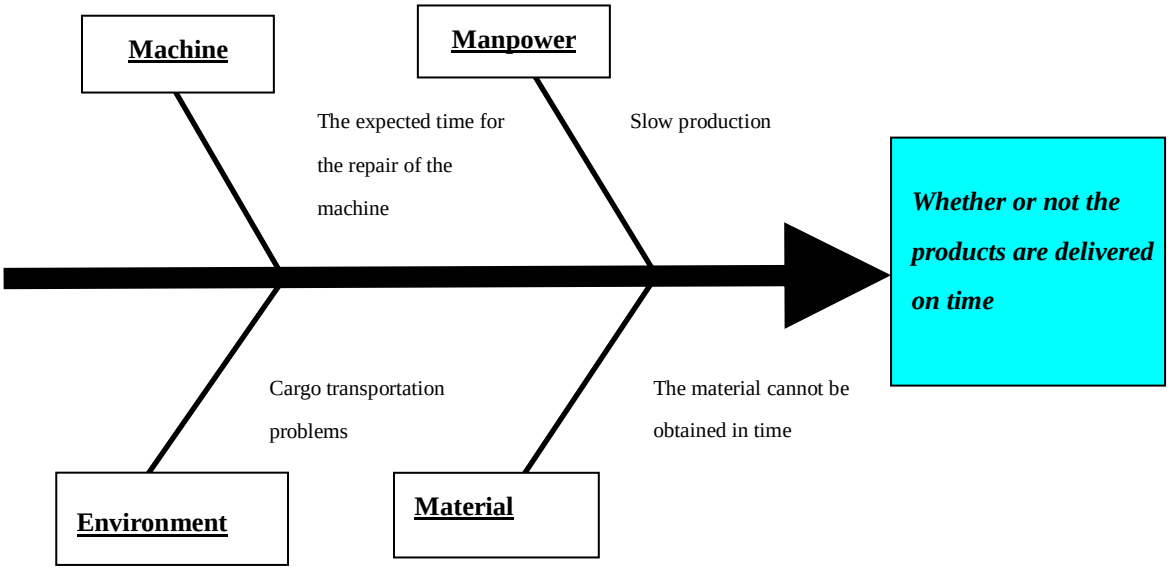


Fig.2 analyzes the level of overall satisfaction rating for the issue of product information, company employees under the cause-and-effect diagram was investigated. This cause-and-effect diagram is drawn and the possible reason for the problem was uncovered. These reasons formed a team and brainstorm method unfolds the reasons given in the decision.Employees of the company, after analysis of the level of product knowledge again gathered a team; to find the root cause of the problem the ideas were exchanged.

As a result of these studies, the most distress survey their customers the company talks about the level of product knowledge workers lack the most basic reason was determined that the level of their knowledge.Pareto analysis cannot be the second issue of whether the timely delivery of products as dissatisfaction cause-and-effect diagram is given in Fig.3.

Fig-3. Cause-and-Effect diagramonwhether or not thetimely deliveryof products



Timely delivery of the products under analysis the overall satisfaction score in Fig.3 cannot be the subject of whether the cause-and-effect diagram was investigated. This cause-and-effect diagram is drawn and the possible reason for the problem was uncovered.Ensure timely delivery of products on time cannot be determined whether or not the material is about. The products to be examined on the basis of other dissatisfied customer complaints analysis of cause and effect have been taken into account are given in Fig.4.

Fig-4. By Product customer complaints have been taken into account in the Cause-and-Effect Diagram

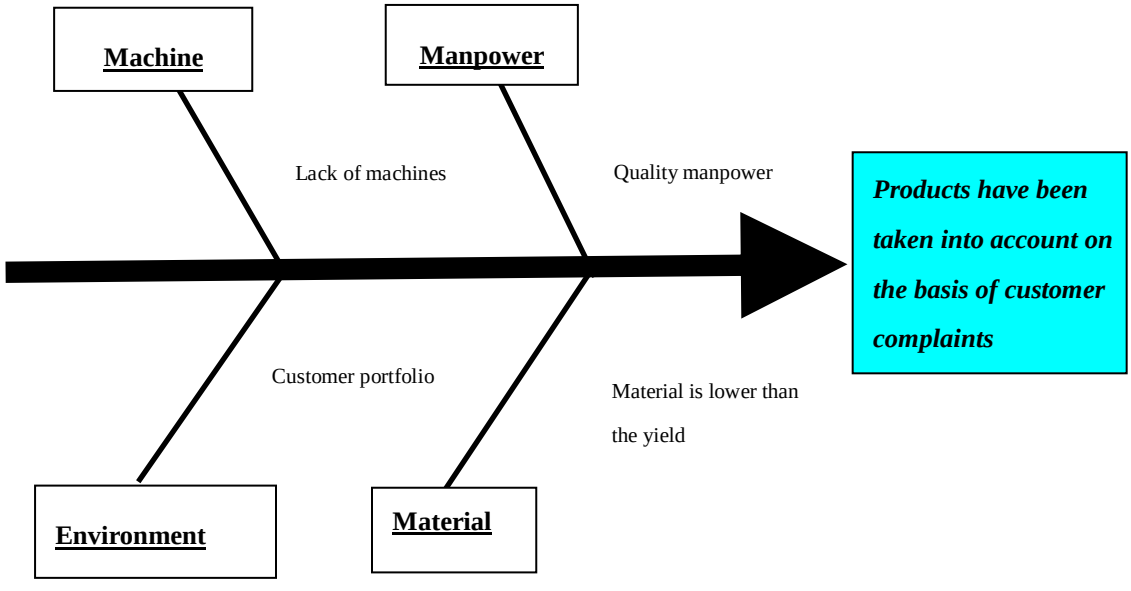


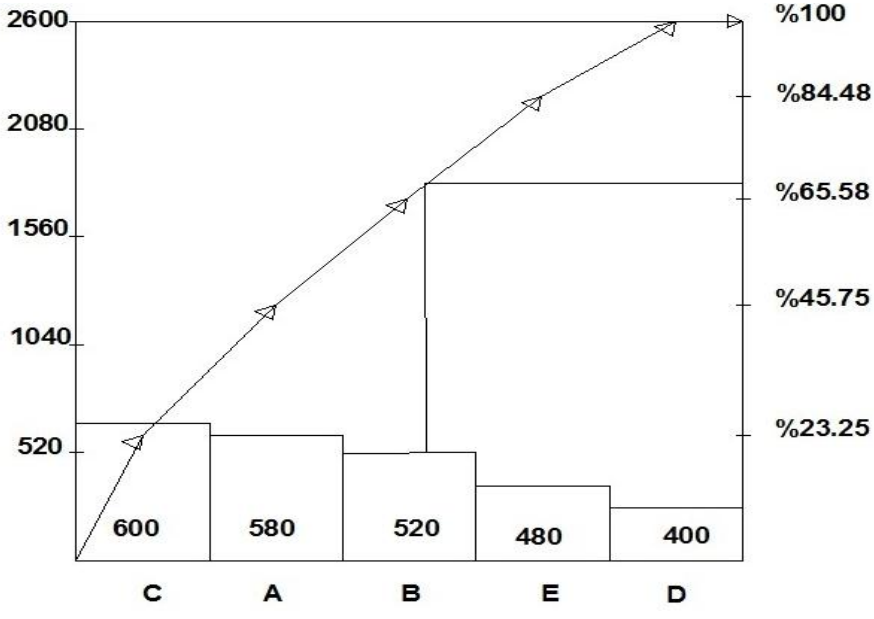
Fig.4 taken into consideration and not taken based on the product because of customer complaints is concluded that there is no quality of the labor force within the business. Product features five questions were asked in this chapter for the scope of additional work from. This is shown in bulk Pareto analysis data codes and other data are provided in table (2).

Table-2. Product features in addition Pareto analysis scope of work data

Code	When questioned, thecriteria	Score	percent	Cumulative (percent)
C	Suitability of the product the production of a wide variety of business	600	23.15	23.25
A	Suitability of the product process of workshops designed	580	22.48	45.73
B	Compliance with the fabrication of the product	520	20.15	65.88
E	Sizes produced in compliance with the standards of the product	480	18.60	84.48
D	Compliance with quality standards	400	15.50	100.00
	TOTAL	**2580**	**100.00**	

These values are generated Pareto diagram in Fig.5.

Fig-5. Product features of the scope of the additional work arising from the Pareto diagram.



A-Suitability of the product process of workshops designed

B-Compliance with the fabrication of the product

C-Suitability of the product the production of a wide variety of business

D-Compliance with quality standards

E-Sizes produced in compliance with the standards of the product

As a result of the pareto analysis dissatisfaction business 70% of the production of a variety of product condition (A) and the conformity of the product contemplated workshop process (A) issues dissatisfaction has been determined that should be started, and examination of these two compounds has emerged as the primary process. Pareto analysis of the suitability of the technique of making the product (B) in 70% of language appears to be. However, this problem is rarely present in this study because there was no need to examine on-site.

Company officials with the highest dissatisfaction with clients for C and A-coded factors were interviewed again, these factors were asked which they live stages of the problem. Cause-and-Effect Analysis of the possible reasons for this is to learn (fish bone diagram) was utilized.
Product features of the product, the production of a wide variety of businesses under the scope of additional work arising from the issue of compliance with cause-and-effect diagram shown in Fig.6.

Fig-6. Cause-and-Effect diagram of the enterprise in the production of wide range of products

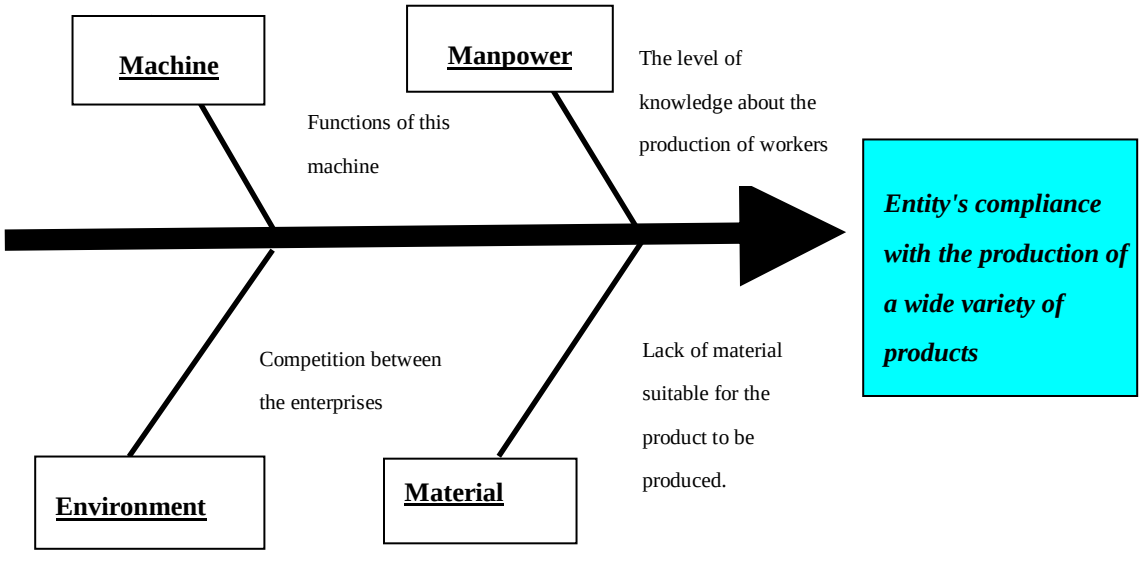


Fig.6 items attributable to the production of additional work scope of the suitability of the product under the subject of a wide variety of business cause-and-effect diagram was investigated. Machines are the cause of this problem is most noticeable enough to affect the function in regard to the lack of a consensus has been reached.Additional work under the scope of the product from the characteristics of the process of the second workshop about the suitability of the product that caused the intended cause-and-effect diagram is given in Fig.7.

Fig-7. Cause-and-Effect diagram of the process workshop about the suitability of the product is designed

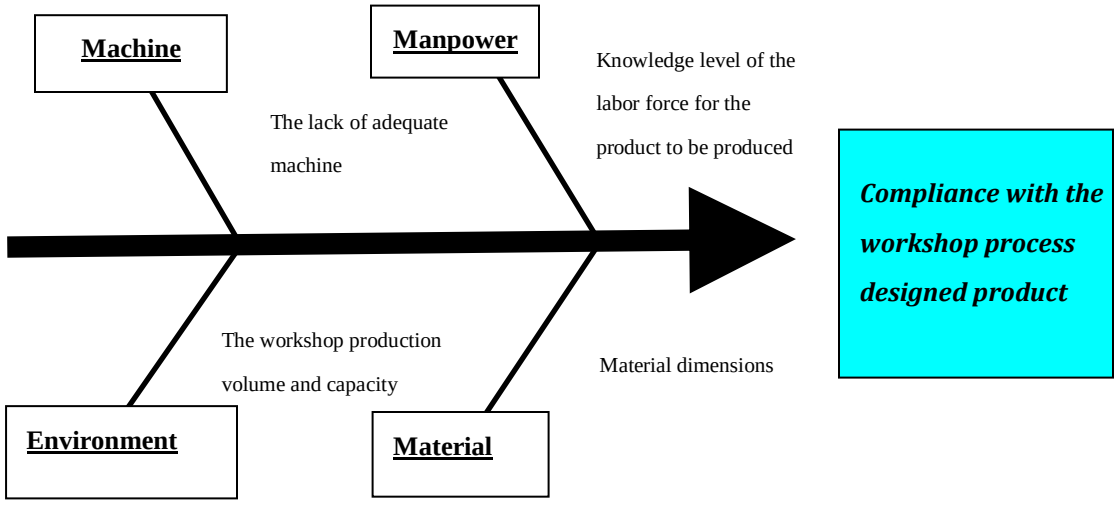


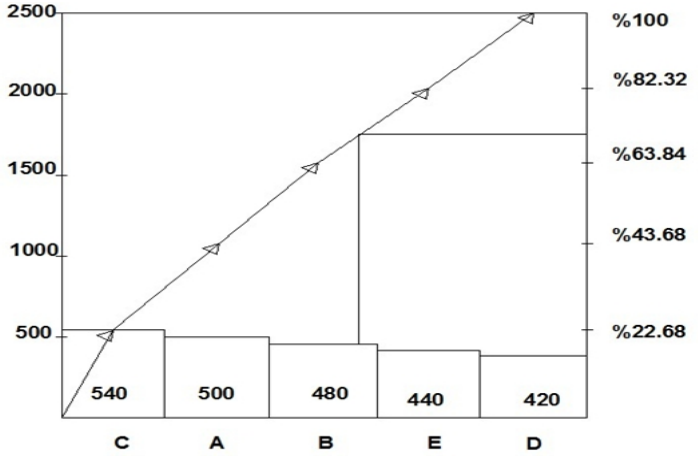
Fig.7 is designed under the scope of the product features of the product for additional work arising from the cause-and-effect diagram drawn about the suitability of the workshop process and uncovered possible causes that may affect the product. Company in accordance with the opinions of the authorities and the capacity of the most noticeable effect on the volume of production can cause regarding the workshop, a consensus has been reached. The process or method in this chapter for the scope of the extra work caused by the five questions was asked. These codes and other data are collectively shown in Table (3), Pareto analysis.

Table-3. Scope of work caused by the addition or Pareto analysis method process data

Code	When questioned, thecriteria	Score	percent	Cumulative (percent)
C	Interprocess stock	540	22.68	22.68
A	The use of appropriate machinery in each product	500	21.00	43.68
B	Balancing machine	480	20.16	63.84
E	Diligent workers to ensure proper working methods	440	18.48	82.32
D	Machine placement scheme	420	17.64	100.00
	TOTAL	**2380**	**100.00**	

Paretodiagramformed bythese valuesasshown in Fig.8.

Fig-8. Additional caused by the process or method of Pareto diagram scope of work



A-The use of appropriate machinery in each product

B-Balancing machine

C-Interprocess stock

D-Machine placement scheme

E-Diligent workers to ensure proper

As a result of the pareto analysis of 70% of dissatisfaction buffer storage (C) and the use of the appropriate machine for each product (A) issues dissatisfaction has been determined that a Pareto analysis and also for bonding with B coded in machine language is seen that 70%. Due to this problem, however, is rarely present in this study there was no need to examine on-site. Cause-and-effect diagrams on these two codes are as follows, respectively, Fig.9 and Fig.10 are provided.

Fig-9. Intermediate stock on the Cause-and-Effect diagram

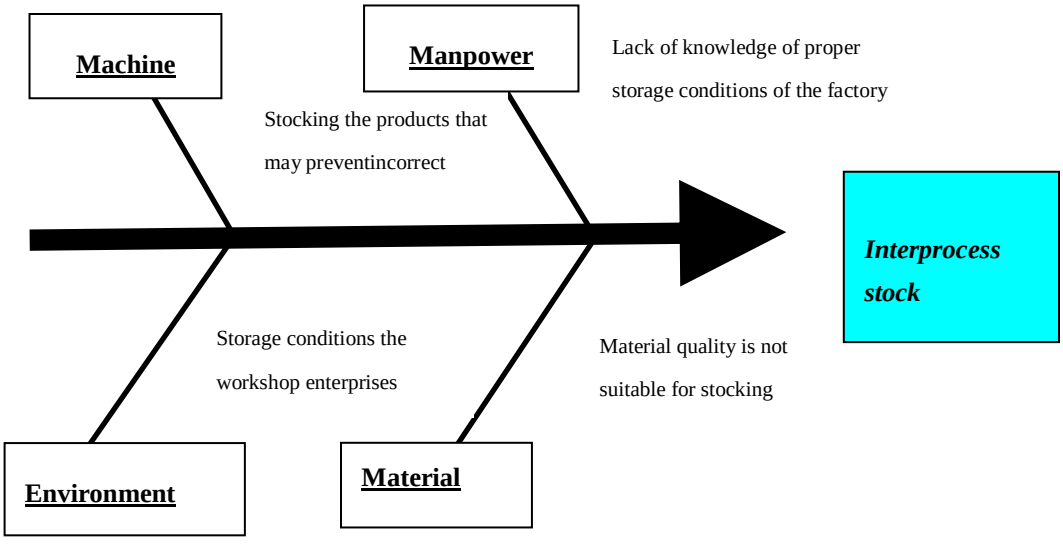
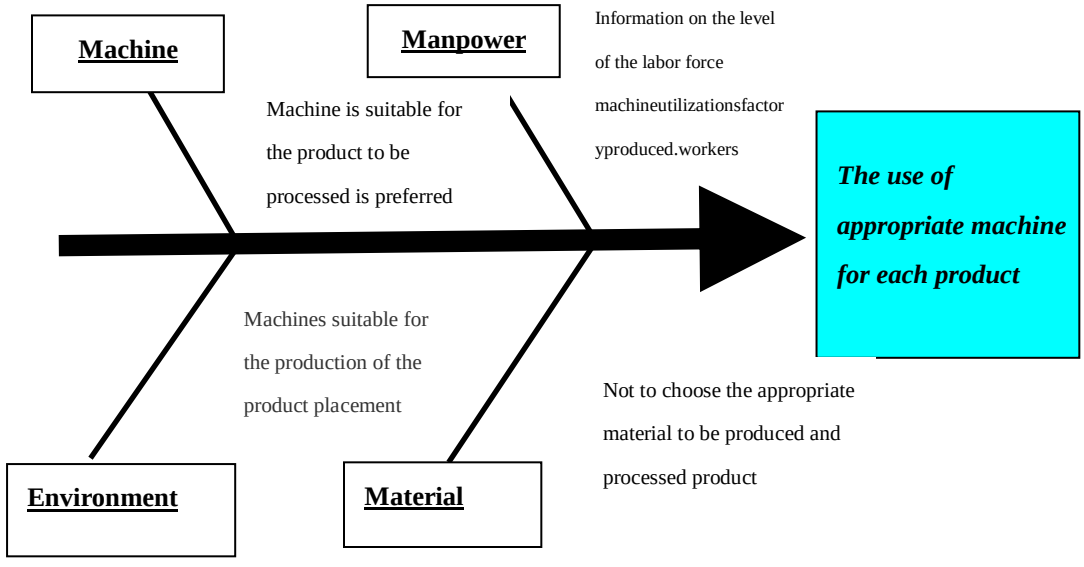


Fig.9 additional work caused by the scope of the analysis process or method of cause-and-effect diagram drawn on the bottom of the intercrosses stock was uncovered and possible causes. These reasons formed a team and brainstorm method unfolds the reasons given in the decision.In determining the most fundamental reasons search inventory and the most notable causes that may affect the subject taken into account.

Company officials' accordance with the opinion given in terms of environmental factors cause the most noticeable effect of storage requirements within the factory, a consensus could conclude respect.

Fig-10. Cause-and-Effect diagram concerning the use of appropriate machinery in each product



The process or method according to Fig.10, the bottom of the scope of the extra work caused by the use of appropriate machinery in each individual cause-and-effect diagram drawn on the issue and possible reasons were revealed.

After, analysis of the issue of the use of each machine is suitable for the product again assembled a team to find the root cause of the problem for the exchange of ideas. In determining the most fundamental reasons search inventory, and the most notable causes that may affect the subject taken into account. Company officials accordance with the opinion given in terms of the most noticeable factor is the cause machine failure to choose the appropriate machine could be effected without regard to the product to be processed, a consensus has been reached. Scope of this study to determine the lost time in the three main headings have been given the additional questions of the scope of work based on the survey data, some results have been obtained. Overall satisfactions core is the winner of three mains cope of the multi-product information in the enterprise-level officials

deficiencies in accordance with the opinion of the material cannot be obtained in time and quality of the labor force increased as a result of failure.

Scope, which is the second product from the characteristics of the three main scope of business as a result of the additional functions of the machines, did not have enough production volume and capacity of the workshop is the result of that obstacle to the production of various products. Third of the three main scope as a result of the processor factory methods within the scope of the extra work caused by inadequate storage condition sand product should not be preferable to use the appropriate machine in terms of efficiency was found to bean obstacle.

CONCLUSION

Especially if the material is expensive and cannot be obtained, the model of the product in the best possible way to use less material to prepare such a way that the construction, decided to purchase the plant and equipment to operate with a certain level of performance in terms of their economic, ensuring that the material will be able to be consumed.

If you use the product model of the economic process and production methods is the case, this is usually the drafters of the model stems from the lack of workshops have sufficient knowledge about the process. Be produced large amounts of the product or a similar product made by the firm of rows If so, the production of a correction in terms of convenience, the product is still under development, this stage examines the production and assembly of components and production staff are engaged, tools, and equipment with carrying out the changes before spending the money to get there. Also changes to the model are made in order to avoid unnecessary use of material and meet the desired specifications to identify the experiments performed to obtain the product.

If the quality standards of the product is higher than that required for the use of a factor, the time spent on production in general, it would be longer because it requires more careful study. Some of the specific requirements of customers over time will cause the production of the product. For this reason, quality standards must have a certain consistency.

The concept of efficiency in enterprises on behalf of the planning process has gained importance in today's circumstances. Process planning of products and parts made machines, the necessary vehicles and their speeds, providing raw materials and supplies, and all the conditions related to the operation of machines is responsible. Persons responsible for this process are to reduce the scope of work furniture enterprises are obliged to do research. A good maintenance, good operation of machinery and equipment, reduce capital expenditures, and thus provides a longer life.

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