

# **SEVEN QUALITY TOOLS A REVIEW FOR MANUFACTURING SYSTEMS**

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## **Abstract:**

Nowadays completion is very high in improving productivity for every company. This can be achieved by using seven quality tools. The application of these tools is very easy and large amount of problems can be solved. These quality products satisfy customers need improve its productivity. This study is about having an overall view of seven quality tools and its application.

**Key Words:** Flow Chart, Pareto Chart, Scatter Diagram, Histogram, Cause & Effect Diagram, Control Charts, Check Sheets

## **1. INTRODUCTION**

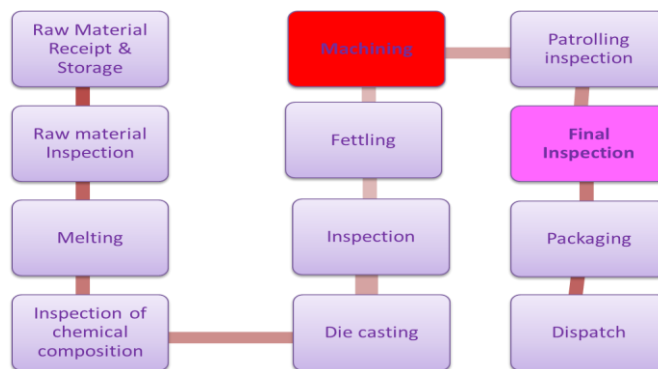
The quality tools are developed in Japan by quality gurus as Deming and Juran after Second World War. According to Kaoru Ishikawa 95% of problems can be solved by using seven quality tools. These tools can be used from product development to marketing [1].

The seven quality tools are

- 1) Flow Chart
- 2) Check Sheets
- 3) Pareto Chart
- 4) Histogram
- 5) Cause and effect diagram
- 6) Scatter diagram
- 7) Control Chart

## **2. SEVEN QUALITY TOOLS**

Any improvement in product can be done by understanding quality improvement process in industry. This improvement can be achieved by implementing seven quality tools. These tools are very easy to understand and step by step process implementation leads to better results. Seven quality tools make process analysis less complicated for average industry worker [2].



**Fig -1:** Flow chart

**Check Sheets**

**Flow Chart**

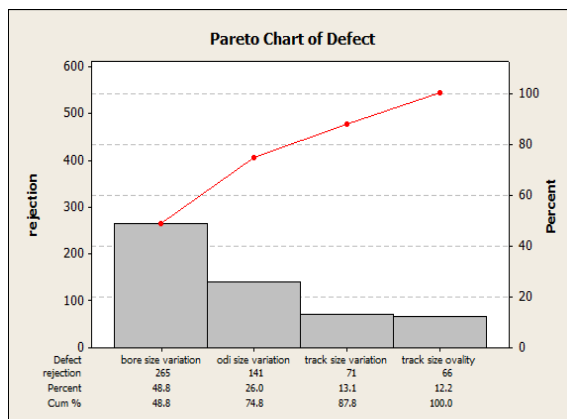
Flow chart is one of the basic tool used to study whole process. It shows whole process in step wise manner. Flow chart of whole process from material to product is studied. Graphical representation of the data makes it more simple and easy to understand [3].

Data collection is very important part for analysis purpose. The data is available in different forms depending upon application. Some example of check sheets are maintenance record, attendance record, production log books, defects record, Failure records, etc [1].

**Pareto Chart**

A Pareto diagram, named after Vilfredo Pareto, an Italian economist, is a special type of bar graph that can be used to show the relative frequency of different events such as defects, repairs, claims, failures, or any other entity, in the descending order. This helps to focus on major defect rather than too many small defects, to improve the quality [4].

Pareto chart is used in statistical process control for quality improvement. After collecting data is necessary to arrange it in a proper way to focus on most important factor which is responsible for 80% rejection of product in manufacturing industry. Pareto principle is also known as 80/20 rule.

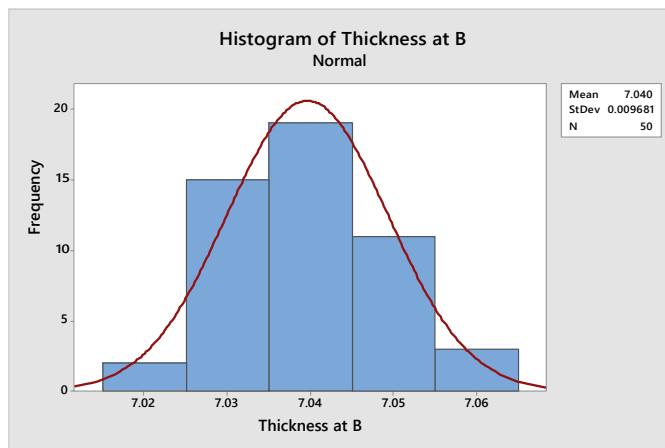


**Fig -2:** Pareto diagram

**Histogram**

Histogram is also known as frequency distribution diagram. The bar charts show distribution pattern in class interval, arranged in order of magnitude. Histograms are useful in studying patterns [1].

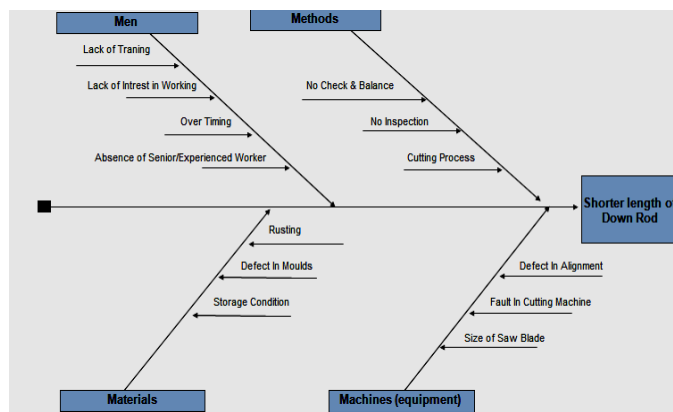
The rectangles area is equals to frequency of variable and width equal to class interval. Histogram is a special bar chart for measuring data. It is used to chart the frequency of occurrence [5].



**Fig -3: Histogram**

**Cause and effect diagram**

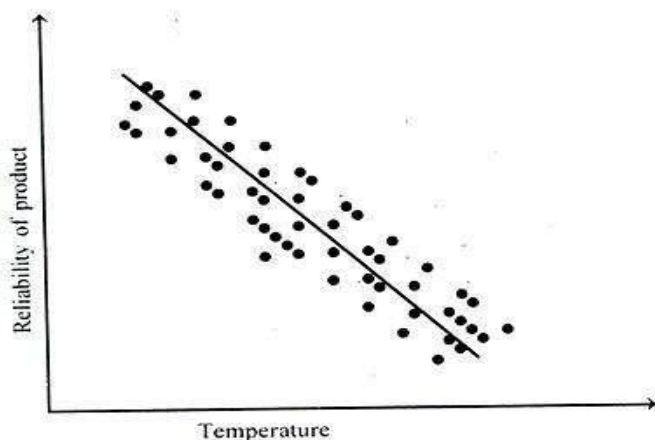
After detecting problems in process it is necessary to find its causes due to which major problems occur. The different factors are considered like man, material, environment and process, etc. It is also known as Ishikawa diagram or fish bone diagram [6].



**Fig -4: Cause and effect diagram**

**Scatter diagram**

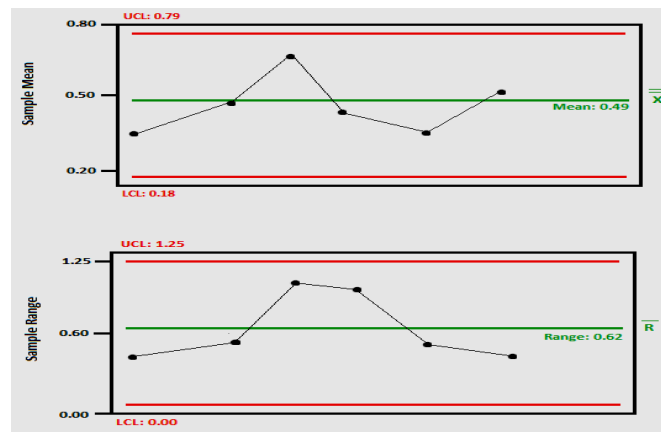
Scatter plot is used to find the relation between two variable. There are two types of relation in scatter plot, first one is positive relation and second one is negative relation [7].



**Fig -5: Scatter diagram**

**Control Chart**

Control charts are used to study how the process changes over time. This tool is used to control data for rejection of any product. After root cause analysis of a problem some solution is provided. So to check the results of solution is incontrol limit or not control charts are used [6].



**Fig -6:** Control charts

### 3. CONCLUSIONS

- Seven quality control tools are easy to understand and easy to use.
- These tools lead to reducing rework of product.
- Quality improvement reduces rejection of product.
- Indirectly improves profit of organization.

### REFERENCES

- [1] Varsha M. Magar, Dr. Vilas B. Shinde “Application of 7 Quality Control (7 QC) Tools for Continuous Improvement of Manufacturing Processes” International Journal of Engineering Research and General Science Volume 2, Issue 4, June-July, 2014 ISSN 2091-2730
- [2] Chiragkumar S. Chauhan<sup>1</sup> Sanjay C. Shah<sup>2</sup> Shrikant P. Bhatgalikar<sup>3</sup> “Quality Improvement By Apply Seven Quality Control (7 QC) Tool in Process Industry” IJSRD - International Journal for Scientific Research & Development| Vol. 1, Issue 10, 2013 | ISSN (online): 2321-0613
- [3] Sulaman Muhammad “Quality Improvement Of Fan Manufacturing Industry By Using Basic Seven Tools Of Quality: A Case Study” Sulaman Muhammad Int. Journal of Engineering Research and Applications www.ijera.com ISSN : 2248-9622, Vol.5, Issue 4, April 2015
- [4] Akshay Jaware<sup>1</sup> Komal Bhandare<sup>2</sup> Gaurav Sonawane<sup>3</sup> Shraddha Bhagat<sup>4</sup> Rahul Ralebhat<sup>5</sup> “REDUCTION OF MACHINING REJECTION OF SHIFT FORK BY USING SEVEN QUALITY TOOLS” International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395- 0056 Volume: Issue: 04| Apr-2018 www.irjet.net p-ISSN:2395-0072
- [5] Deepak<sup>1</sup> Dheeraj Dhingra “APPLICATION OF QUALITY CONTROL TOOLS IN A BICYCLE INDUSTRY: A CASE STUDY” IJRET: International Journal of Research in Engineering and Technology eISSN: 2319-1163 | pISSN:2321-7308
- [6] <sup>1</sup>Shyam H. Bambharoliya, <sup>2</sup>Hemant R. Thakkar “Reducing Rejection Rate in Small Scale Machining Unit Using 7 Quality control Tools- Review ” 2015 IJEDR | Volume 3, Issue 4 | ISSN: 2321-9939
- [7] Milind Raut Dr. Devendra S. Verma “To Improve Quality and Reduce Rejection Level through Quality Control” International Journal on Recent and Innovation Trends in Computing and Communication ISSN: 2321-8169 Volume: 5 Issue: 7