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METRICS

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Abstract:

This document describes the process to develop a useable metric.

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1.0 SCOPE

Explain the relationship between organizational objectives and metrics and provide some examples of the tools and techniques for collecting metric data.

2.0 THEORY

Nothing gets improved unless it is measured and a metric that is not tied to an objective is worthless.

3.0 OBJECTIVES

- 3.1 Focus on Customer requirements
- 3.2 Support goals and targets
- 3.3 Address the desired improvement
- 3.4 Stretch the organization
- 3.5 Allow for measurement

4.0 OVERVIEW

- 4.1 Measurements vs metrics
- 4.2 Tools for data collection
- 4.3 Attributes of a metric
- 4.4 Example of a metric
- 4.5 Metrics development worksheet

5.0 DEFINITIONS

5.1 *Measurement*

The act or process of quantitatively comparing results to requirements to arrive at a quantitative estimate of performance.

5.2 *Metric*

A measurement taken over a period of time that communicates vital information about a process or activity. A metric should drive appropriate leadership or management action.

6.0 TOOLS

6.1 *Sampling*

Sampling instead of 100% measurement is useful when there are too many items to check, destruction of the item is necessary, data is needed quickly or data collection is expensive. Acceptable sampling plans are based on Society Standards such as ANSI Z 1.4 for Attributes or ANSI Z1.9 for Variables. Administrative costs and difficulties can be avoided by [REDACTED]

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6.2 Check Sheet

The results of a measurement sample can be presented on a check sheet to establish a trend.

The check sheet can list attributes or variables type data:

Attributes type data		
Standard	Quantity	
Not...	HHH	
Not...		
Should Be...		
Should Be...		
Not...		
Should Be...	HHH HHH HHH	

Variables type data		
Time Study	Quantity	
1-4	HHH	
5-9	HHH HHH	
10-14	HHH	
15-19		
20-24	HHH HHH	
25-29	HHH HHH	

6.3 Frequency Table

The check sheet is useful as a snapshot of the counts of an activity but it is not a metric.

The check sheet can be improved by converting it to a frequency table:

Attributes type data		
Standard	Quantity	Frequency
Not 1...	HHH	7
Not 2...		3
Should Be 1 ...		2
Should Be 2...		0
Not 3 ...		0
Should Be 3...	HHH HHH HHH	15

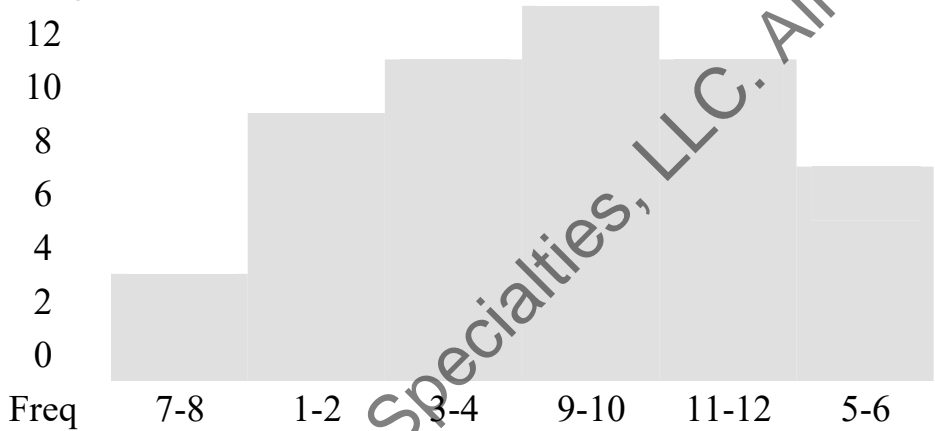
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Variables type data		
Time Study	Quantity	Frequency
1-2	HHH	7
3-4	HHH HHH	10
5-6	HHH	5
7-8		2
9-10	HHH HHH	12
11-12	HHH HHH	10

6.4 Histogram

The frequency table helps to quantify the cumulative number of recurring events but it is not a metric. Converting the frequency data to a Histogram is useful to display the central tendency of the data:

Histogram of Variables Data



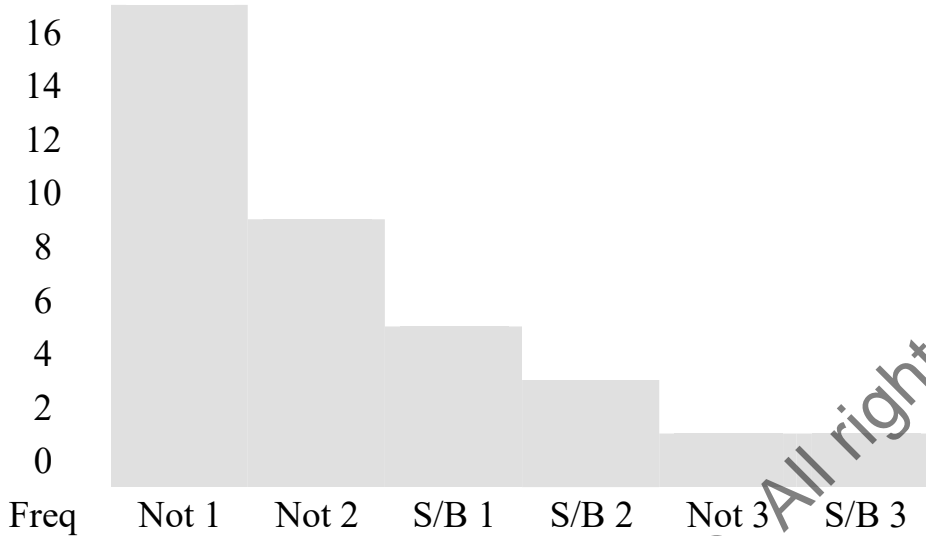
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6.5 Pareto Analysis

The frequency table helps to quantify the cumulative number of recurring events but it is not a metric. Converting the frequency data to a Pareto Chart is useful to display the most recurring event to the least recurring event:

Pareto Analysis of Attributes Data



6.6 Miscellaneous Charts, Diagrams and Statistics

Trend and control charts accumulate data over time so they are more than a snapshot of events but they are still not data that meets the attributes of a metric. A scatter diagram can be used to define the correlation between two data sources to determine if there is a negative, positive or non-existent relationship but the diagram is not a metric because [REDACTED]

A process flowchart defines the sequence of operations that supports a system of activities but by itself it is not a metric. Parametric and non-parametric statistics are powerful tools to understand the interaction of process variables but they do not meet the attributes of a metric.

7.0 ATTRIBUTES OF A METRIC

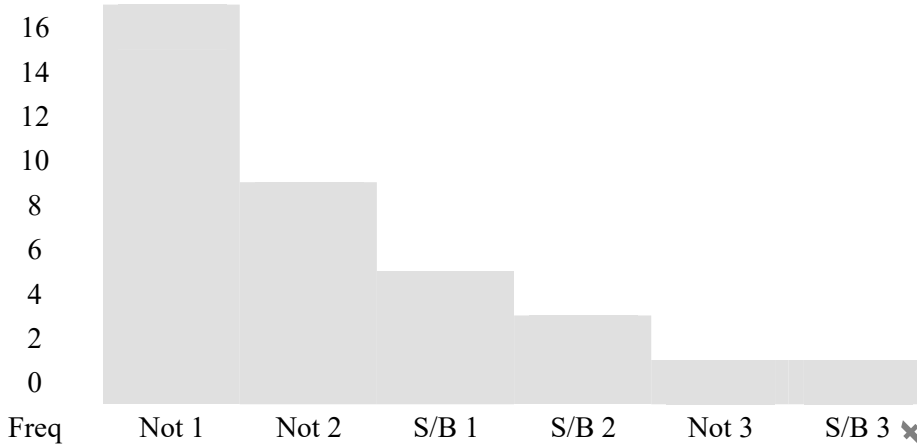


7.9 Metrics are not charts, schedules, goals or objectives, counts of activity or snapshots.

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8.0 EXAMPLE OF A METRIC

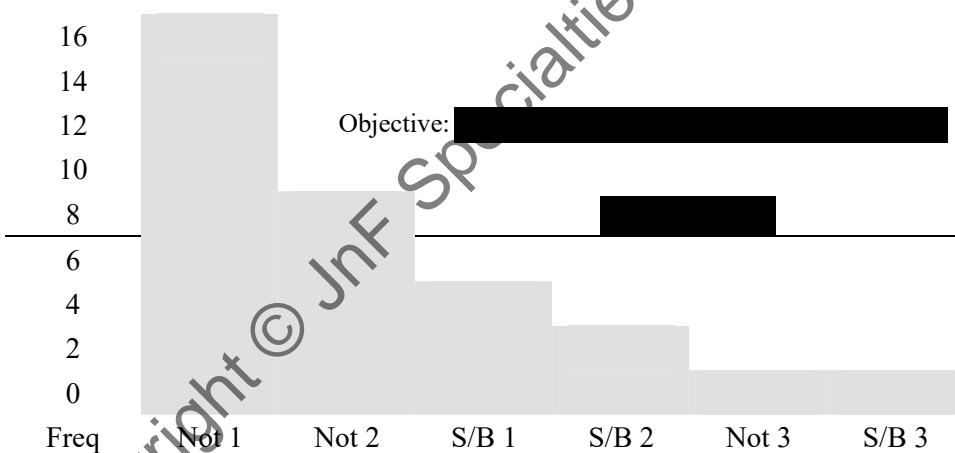
Lets examine the Pareto Analysis of the Attributes Data



The chart has value because it identifies the <few> from the <many> but it is not a metric by itself unless it is tied to an objective. The objective in this case could be [REDACTED]

Don't presume that the most recurring defect is the most costly – use cost analysis to interpret the Pareto chart and focus on the most effective reduction effort. If you were to overlay a line on the chart that establishes an objective for reduction then the chart would be better but it would still not meet the attributes of a metric.

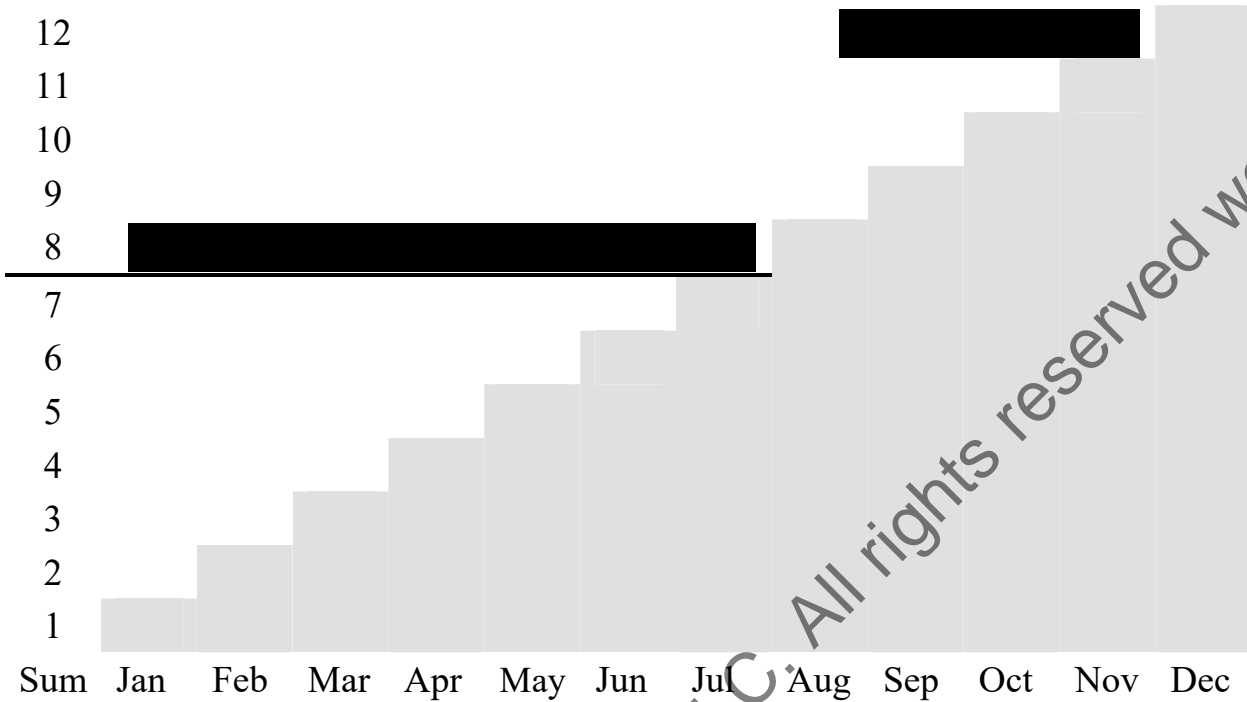
The chart has been modified to define the objective for defect reduction:



The modified chart is still not a metric because [REDACTED]

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The following chart is the best representation of a metric:



The chart now meets the objectives of a metric because

The metric is now more than just a simple chart, schedule, goal, objective, count of activity or snapshot in time. Use the following worksheet to develop your own metric and display every metric in a conspicuous location in your Company to reinforce its benefit to the organization.

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METRICS DEVELOPMENT WORKSHEET

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[Redacted]
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