

Consistency Checking of End-User Response Times

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ISIW = Imperfect Solutions for an Imperfect World.

CSEB = Consistent Service Equals Bucks.

There are two reasons for hesitancy in applying consistency measurement to network performance data.

1) Not too many people know how to do it and

2) networks tend to develop crisis's that prevent consistency issues from arising.

Assumptions:

1) Data Communications Measurement is an imperfect and primitive science.

2) Performance data is seldom statistically ideal.

3) Data Communications Performance data is normalized data. This means that networks behave in a somewhat predictable manner. That many similar-type network elements if plotted will show a normal or bell shaped curve. Where a small number of elements will show poor performance, a similar number exceptional performance and the most elements will fit in between.

The following example uses data lines as the network elements and response time (in seconds) as the units of measurement.

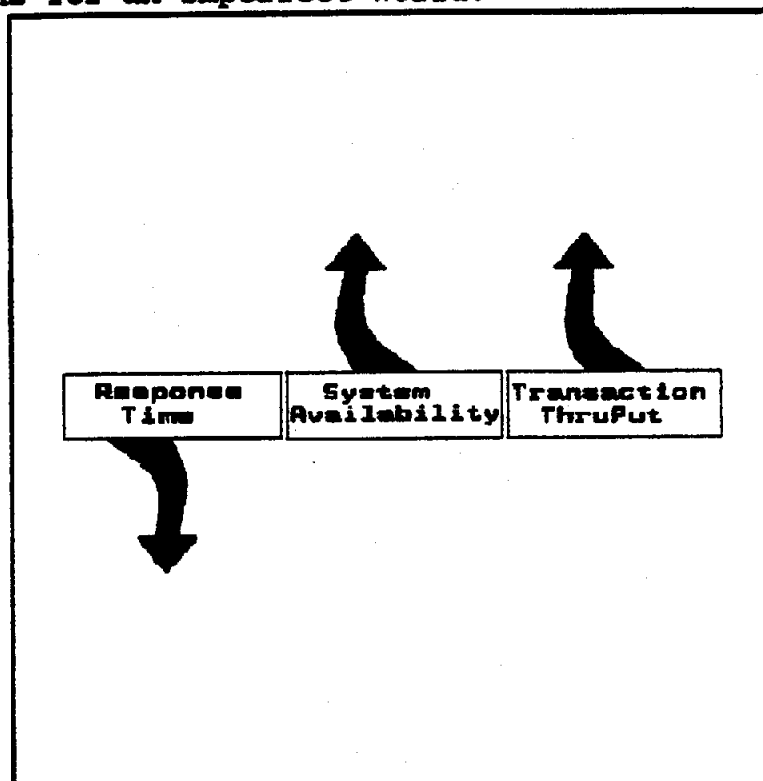


Figure 1 - Traditional Tuning Objectives

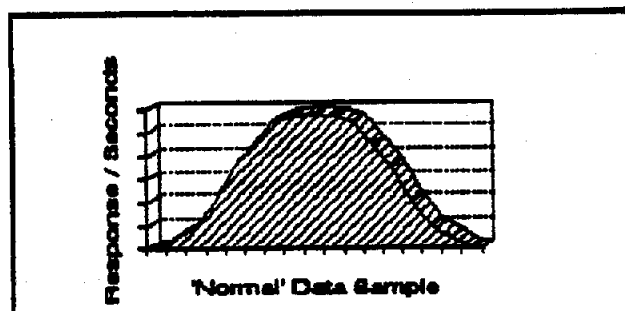


Figure 2 - The Bell Curve

Hedging Your Bet:

1) Use 'like-type data': This is important to reduce distortions. See that your data input follows standard profile rules.

Data Profile Rules:

1) Use the smallest measurements possible. Data should be detailed and discrete. Select line data gathered on a transaction basis over data collected and summed every in five minutes. Data summed in five minutes intervals over hourly, hourly over daily, etc.

2) Data should be of the same general mix of applications, e.g. 90% CICS transactions and 10% IMS transactions.

3) Use data with the same type network hardware and operations, same protocol, line speed (baud) and carrier facilities.

4) The larger the data sample the more reliable your results.

5) If your data traffic varies between week days and the weekend analyze exceptions separately.

The Algorithm:

Mean Upper Control Limit = $X + (3 * \text{standard deviation})$

Mean Lower Control Limit = $X - (3 * \text{standard deviation})$

Where X = the overall mean of response times.

Analysis 1:

1) Determine the mean and standard deviation of entire data sample.

2) Compute the upper and lower control limits based on algorithm.

3) Compare individual response times entries with the upper and lower control limits. Those greater than the upper limits or those below the lower limits are elements with inconsistent response times.

Analysis 2:

Repeat the procedures in Analysis 1 using the overall and individual ranges instead of response times, results exceeding the control limits on range testing are lines that fluctuate wildly.

NOTE1: This formula should work on randomly collect samples.

NOTE2: the number 3 is not mystical according to the discipline that this technique is borrowed from, it should in the 'idyllic state' account for about 99% of the data. If your experience varies widely from this you may be using data that is 'not' normal. In some instances slightly adjusting this number up or down is productive.

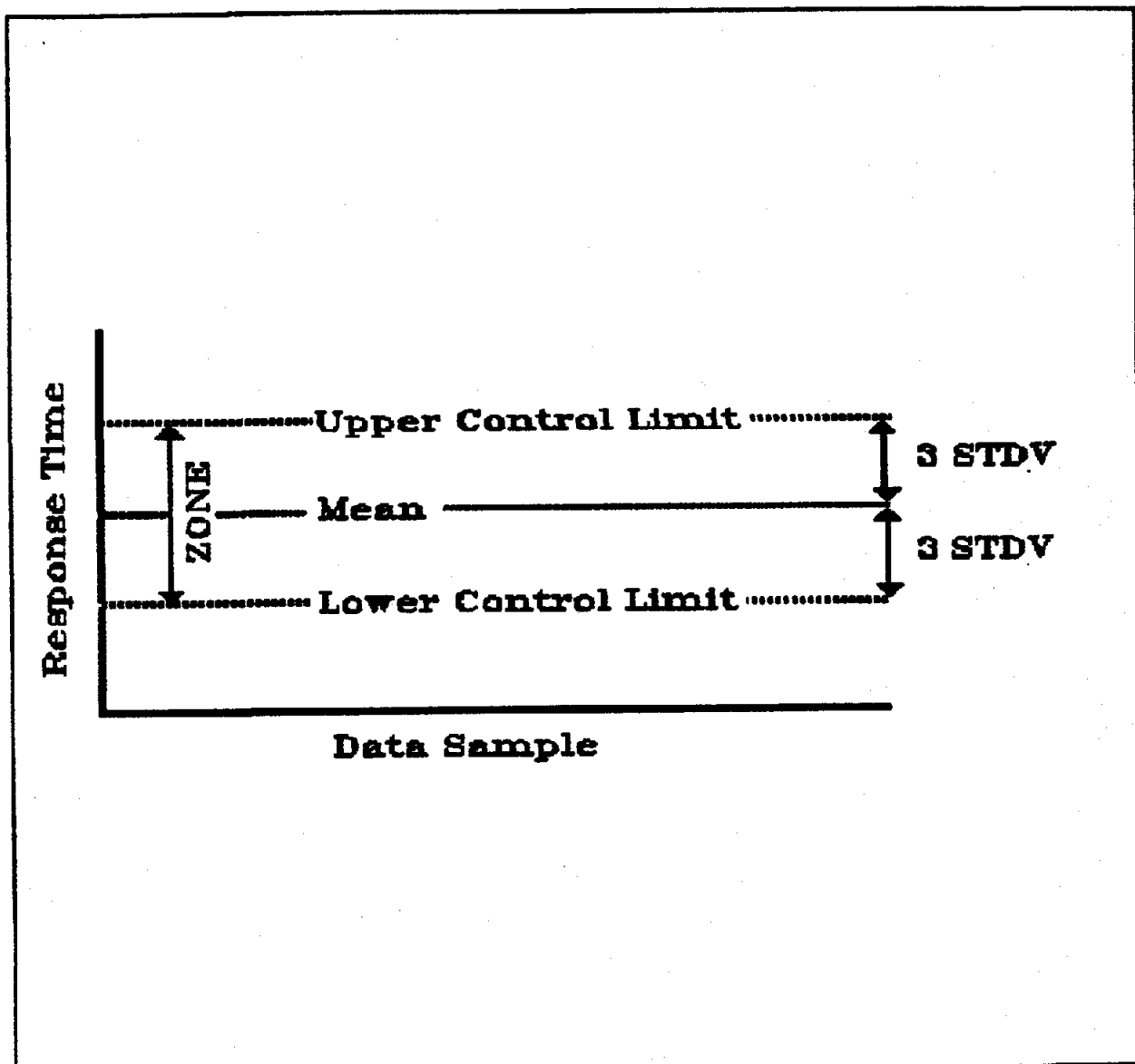


Figure 3 Setting the Upper and Lower Control Limits

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