ITIL® Poster Series #43
Problem Management - Pareto Analysis

Good e-Learning

Introduction

This technique was identified by Vilfredo Pareto an Italian economist. It can be used for quality improvement, on the analysis that a large majority of problems (80%) are produced by a few key causes (20%). This is also known as the vital few and the trivial many.

Used as part of the problem management process, this can assist in identifying where the emphasis of root-cause analysis should be focused.

PARETO CHART

Pareto Analysis is a simple technique for prioritizing possible improvements or changes by identifying the problems that will be resolved by making them. Using this approach, you can prioritize the individual changes that will most improve the situation.

Pareto Analysis uses the Pareto Principle – also known as the "80/20 Rule" – which was developed by Joseph M. Juran in 1937. It is the idea that 20 percent of causes generate 80 percent of results. With this tool, we're trying to find the 20 percent of work that will generate 80 percent of the results that doing all of the work would deliver.

THE APPROACH PROVIDES THE FOLLOWING INSTRUCTIONS:
• Form a table listing the causes and their frequency as a percentage.
• Arrange the rows in decreasing order of importance of the causes, i.e. the most important cause first.
• Add a cumulative percentage column to the table. By this step, the chart should look something like Table Pareto cause ranking chart, which illustrates 10 causes of network failure in an organization.
• Create a bar chart with the causes, in order of their percentage of total.
• Superimpose a line chart of the cumulative percentages. The completed graph is illustrated in the Chart of Network Failures.

• Draw a line at 80% on the y-axis parallel to the x-axis. Then drop the line at the point of intersection with the curve on the x-axis. This point on the x-axis separates the important causes and trivial causes. This line is represented as a dotted line in the chart.

In the example below, the table and chart show a high volume of network controller failures, file corruptions and the need to address network conflicts. The volume of failures relating to these areas make up over 80% of the cumulative volume of failures across the network.
Using this approach allows us to see the benefits that may be achieved in network stability if we address these high volumes, and reduce them.
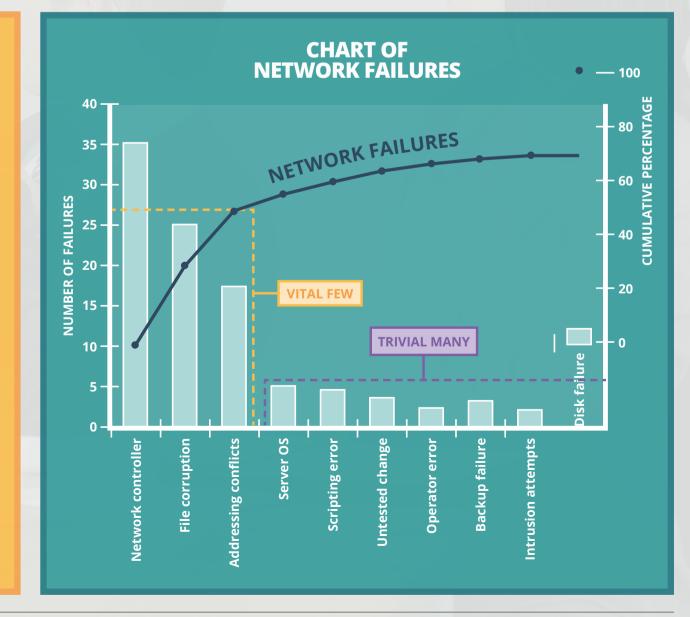
TABLE: PARETO CAUSE RANKING CHART

NETWORK FAILURES

Causes	Percentage of total	Computation	Cumulative (%)
Network controller	35	0 + 35%	35
File corruption	26	35% + 26%	61
Addressing conflicts	19	61% + 19%	80
Server OS	6	80% + 6%	86
Scripting error	5	86% + 5%	91
Untested change	3	91% + 3%	94
Operator error	2	94% + 2%	96
Backup failure	2	96% + 2%	98
Intrusion attempts	1	98% + 1%	99
Disk failure	1	99% + 1%	100

CHART OF NETWORK FAILURES

NETWORK FAILURES

VITAL FEW

TRIVIAL MANY

NUMBER OF FAILURES — Network controller, File corruption, Addressing conflicts, Server OS, Scripting error, Untested change, Operator error, Backup failure, Intrusion attempts, Disk failure

CUMULATIVE PERCENTAGE