QuickTip - Pareto Analysis

Pareto analysis is used to help decide which of many causes to focus on in order to change a situation most effectively. It takes advantage of the Pareto Principle, which says that most problems have only a few primary root causes. Fixing those root causes will fix most of the resulting problems.

When to Use

Use this technique when you don't have enough time or resources to fix everything and want to focus on the things that will have the biggest effect on a situation.

It is often used together with cause and effect analysis. Cause and effect analysis is used to figure out the root causes of a situation, then Pareto analysis is used to decide which of those causes to focus attention on. A Pareto chart plots the frequency of occurrence of causes in descending order.

Procedure

1. Decide what causes you will analyze or what categories you will use to group items. For example, if you are working on improving customer service, you might use categories like "excessive wait time" or "unable to fix customer's issue."
2. Decide how to measure the categories. Common measurements are number of occurrences, frequency, cost, and time spent. For the customer service example, you could measure number of occurrences (how often the representative was unable to fix the issue) or frequency (what percentage of the interactions resulted in no fix).
3. Decide what period of time you will analyze. It should be long enough to capture a valid picture of what is happening, but not so long that it will be unfeasible to gather data.
4. Collect data for each category or gather data that already exists. Subtotal into each category.
5. Plot the categories on a column chart in decreasing order. If there are many categories with small measurements, they can be grouped as "other."
6. Optionally, also plot a line that shows the cumulative contribution of causes (see example below). This line should reach 100% at the rightmost category.
7. Based on this information, decide which categories you will focus on to get the most return for your improvement effort.

Example

Quality pioneer Joseph Juran popularized the Pareto Principle, which he named after Vilfredo Pareto, a 19th century Italian economist who developed a theory of unequal distribution. Pareto

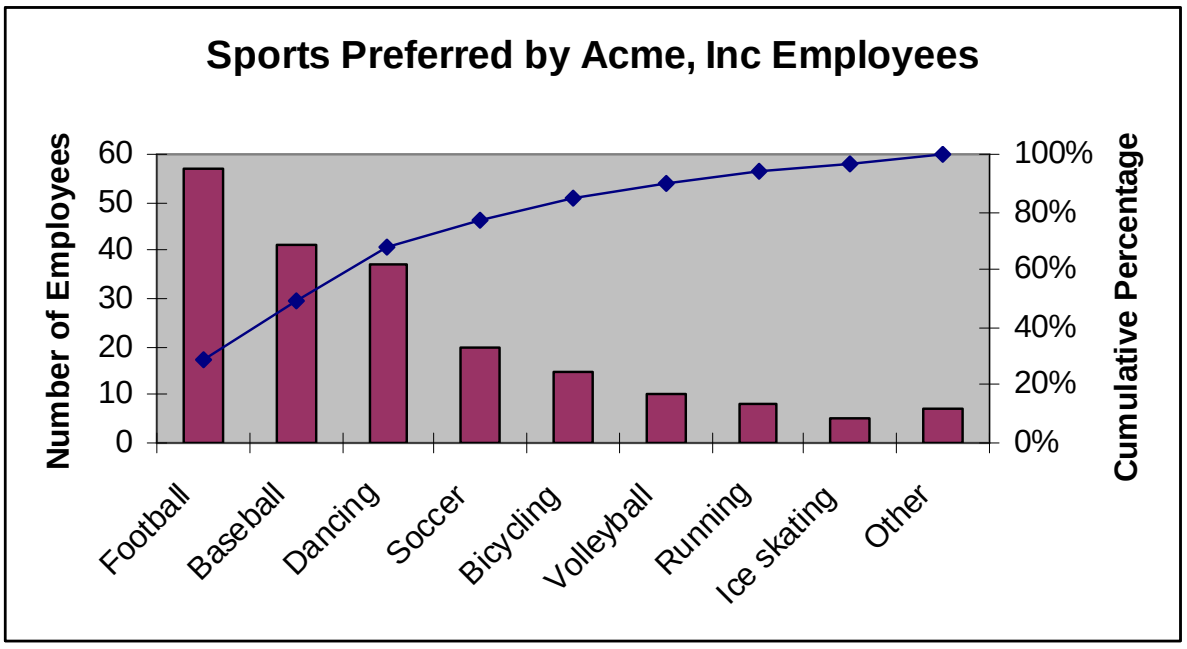
observed in the area he studied that 80% of the wealth was held by 20% of the population. The 80-20 ratio, or one similar to it, seems to apply to many situations.

For example, if 80% of customer complaints are caused by 20% of the issues that we have uncovered, we should focus on fixing those few issues to get the most return on our quality improvement investment.

The example Pareto chart below shows the primary sports that are preferred by employees at a company, which plans is doing a Pareto analysis to guide its decisions on which recreational benefits to offer to them.

By convention, the causes (in this case sports preferences) are arranged left to right in decreasing order of contribution. The columns show the number of employees who named a certain sport as their first preference, and the blue line shows the cumulative percent contribution of each sport in order of preference.

In this example, just over 80% of employees would get access to their preferred sport if the company offered opportunities for the leftmost four – football, baseball, dancing, and soccer. This isn't 80-20, but it illustrates that focusing on a subset of causes can satisfy most of the need.



See more about Pareto analysis at ASQ's quality tools resource center:

https://asq.org/quality-resources/pareto