Mike Jorgensen
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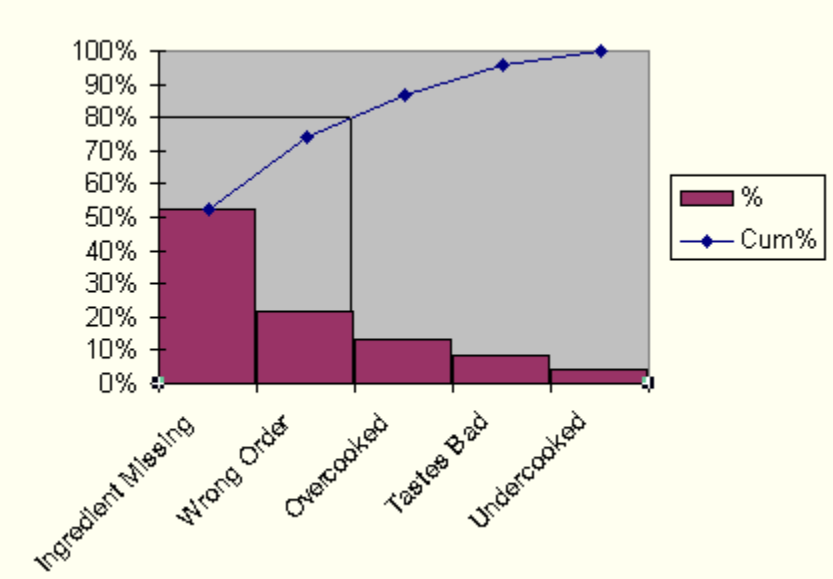
Pareto Analysis

The Pareto Analysis is a quality tool that helps you to solve the most vital problems in your work environment. It can be used in a technical sense to try and improve a process by eliminating defects. It can be used in a human resources sense to try and find the biggest time-wasters in any given work environment. It can be used in brainstorming sessions to find out what the biggest obstacle to reaching a goal may be. In fact, the uses to this tool are almost limitless. The Pareto Analysis is based on a principle put forth by Italian economist Vilifredo Pareto, who was born in 1848 and began an academic career in 1893, which lasted until he died in 1923. The concept at the base of this principle is to focus attention on the "vital few versus the trivial many". For Pareto, an economist, the idea was that 80% of the money was controlled by 20% of the people. Alan Lakelin (a time management specialist) and Joseph Juran adapted this concept to quality management, using the idea that approximately 80% of the problems are created by approximately 20% of the causes. Or conversely, the idea that 20% of what is done contains 80% of the value. Therefore, by concentrating on the vital few, the 20% of the problems creating most of the issues, the overall process is improved dramatically.

There are basically four steps involved in creating a Pareto Analysis. First, categories must be established for the data being analyzed. For example, burgers being returned at McDonalds might fall into the following categories: undercooked, missing ingredients, overcooked, or wrong order altogether. The second step is to specify the time period when the data will be collected. This is not an ongoing process. This is a process that takes a snapshot of data and assumes statistically that this is a sample of the population that is being looked at. It also might involve a time period that is seasonal and ask questions relating to that season. This might be particularly relevant to someone in the retail industry. Third, a frequency table, or tally sheet is constructed. This should include a column for category, date, and total. Tick marks are made in the appropriate column when the specified category is observed. Finally, using the data collected with the tally sheet, a Pareto diagram is created. The causes are ranked from most to least important and the cumulative percentage is kept track of (first percentage plus second and so on). A horizontal axis is drawn representing

the categories and a vertical axis is drawn representing percentages. A bar graph is created using the individual percentages of each category and a line graph is superimposed over the top representing the cumulative percentages. A line is then drawn from the 80% mark on the Y-axis horizontally until it meets with the cumulative percent mark. A line is then drawn vertically down. Those categories to the left of the vertical line are the categories that should be dealt with first. These will take care of 80% of the problems. Following is an example that might be taken from a fast food restaurant trying to improve its product.



It can be seen from the example that “Ingredient Missing” and “Wrong Order” would be the two problems that this particular restaurant would want to focus on first in order to improve overall customer satisfaction. Working on over or undercooking or tasting bad would still leave the majority of the problem in place.
An example of where one might use a Pareto Analysis might be if you were running a restaurant. Approximately 20% of the menu items would account for 80% of the profit taken in by the restaurant. By using a Pareto Analysis, the restaurateur would know which menu items to focus his business around. Another example of a time when a Pareto Analysis might be used is by a manufacturer of clothing. By monitoring the returns of clothing with a Pareto Analysis, the manufacturer would be able to find the 20% of the root causes behind 80% of the returns. A third example can be seen in the semiconductor industry. Again, a manufacturing process will be looked at but this time the Pareto Analysis will be used inline to determine

defect causes during inspection. Using a Pareto Analysis, engineering can decide which defects warrant the most attention, cut costs, and improve the end result.

If one is interested in getting more information about Pareto Analysis, there are many places to find it. Quality management textbooks such as Managing Quality: An Integrative Approach by S. Thomas Foster, Tools and Methods for the Improvement of Quality by Gitlow, Gitlow, Oppenheim, and Oppenheim, or Handbook of Quality Tools: The Japanese Approach by Ozeki and Asaka. There are also numerous websites available which show how the Pareto Analysis can be a useful tool and how to use it. For example: www.erc.msh.org/quality/pstools/pspareto.cfm or www.hci.com.au/hcisite/Toolkit/paretos.htmor are both good resources. Hopefully this tutorial as well as these other resources will provide a way to improve problems through use of Pareto Analysis whenever problems arise.

Bibliography

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