What Is a Pareto Analysis?

For those in charge, there are usually lots of decisions to be made. The question is, which should be tackled first? To help answer that question, many business leaders conduct a Pareto analysis. A Pareto analysis helps prioritize decisions so leaders know which ones will have the greatest influence on their overall goals and which ones will have the least amount of impact.

The Pareto analysis is also known as the 80/20 rule because it is based on the idea that 80 percent of a project's benefit can come from doing 20 percent of the work. Conversely, 80 percent of a situation's problems can be traced to 20 percent of the causes.

According to the website Better Explained, the technique is named after Italian economist Vilfredo Pareto, who observed that 80 percent of Italy's wealth belonged to only 20 percent of the population.

"The Pareto Principle is the observation (not law) that most things in life are not distributed evenly," Better Explained writes on its website.

Among the examples they give include:

- 20 percent of the input creates 80 percent of the result
- 20 percent of the workers produce 80 percent of the result
- 20 percent of the customers create 80 percent of the revenue
- 20 percent of the bugs cause 80 percent of the crashes

The Process Excellence Network points to two main benefits of using a Pareto analysis. The first is that it can categorize and stratify such things as errors, defects, delays, customer complaints or any other measures of the resulting quality of a business's process so that leaders can identify different classes or types of problems.

Second, is that it graphically displays the results in a Pareto chart or Pareto diagram so that the significant few problems emerge from the general background.

How to make a Pareto chart

While there are several different ways to conduct a Pareto analysis, they tend to revolve around the same guiding principles. According to the website Mind Tools, the six steps to conducting a Pareto analysis are:

1. Identify and list problems: Write a list of all of the problems that you need to resolve.

2. Identify the root cause: For each problem, identify its fundamental cause.

3. Score the problems: The scoring method use will depend on the sort of problem that needs to be solved. If the problem revolves around a business trying to improve profits, then the scoring might center on how much each problem is costing them. Or, if they are trying to boost customer satisfaction, they might score the problems on the number of complaints that would be eliminated if the problem were solved.

4. Group the problems: Group the problems by the root cause.

5. Add the scores: Add up the scores for each cause group. The group with the top score is should be the highest priority, while the one with the lowest score should be the lowest priority.

6. Action: Start tackling the causes of the problems. Deal with the top-priority problem, or group of problems, first.

For those that want a graphical representation of the problems, the Project Excellence Network advises to divide each problem's score by the grand total of all of the scores to get a percentage. Decision makers should then draw a chart with a horizontal axis and two vertical axes. The left vertical axis should be marked in increments from zero to the grand total of all the problem scores. On the other side, the right vertical axis should be marked in increments from zero to 100 percent.

Next, leaders should construct a vertical bar diagram, with the highest percentage score on the left and lowest on the right. According to the Project Excellence Network, the height of each bar should correspond with the value on the left axis and the percentage of the total on the right axis.

Finally, to figure out what percentage of the total problems will be solved when more than one are addressed, a line graph should be added to the top.

"Beginning at the left zero point, plot a line showing the cumulative percentage total reached with the addition of each problem classification," the Project Excellence Network writes on its website. " The line should end at the 100 percent mark on the right axis."

Pareto analysis example

For businesses, there are wide array of ways to use Pareto analyses to their advantage. On example the website Bright Hub PM points to is how to improve customer service at a call center. The first step was to survey customers to find out why they were unhappy with the call center's service.

After getting the response back, the call center then divided the information up by complaint category, which included: "too long on hold," "no evening or weekend staff," "not knowledgeable," "not courteous," "transferred too many times," "could not locate file," "no phone payment options," "hard to understand representative," and "charged more than promised."

They then totaled the number of complaints in each category and figured out a percentage of each. They then figured out the cumulative percentage of the categories by adding them together. Based on the data, it became clear that "too long on hold," "no evening or weekend staff" and "not knowledgeable" accounted for more than 75 percent of the total complaints.

In light of the analysis, it was easy to determine that call center needed to concentrate their efforts on those three complaints in order to make significant progress toward improving their overall customer service.

Other examples can be viewed online at:

- Mind Tools
- ASQ
- The University of Washington
- Rapid Business Intelligence Success
- TechTarget

Pareto Analysis

Using the 80:20 Rule to Prioritize

Avoid the "law of diminishing returns."

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Imagine that you've just stepped into a new role as head of a department. Unsurprisingly, you've inherited a whole host of problems that need your attention.

Ideally, you want to focus your attention on fixing the most important problems. But how do you decide which problems you need to deal with first? And are some problems caused by the same underlying issue?

Pareto Analysis is a simple technique for prioritizing possible changes by identifying the problems that will be resolved by making these changes. By 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.

Note:

The figures 80 and 20 are illustrative – the Pareto Principle illustrates the lack of symmetry that often appears between work put in and results achieved. For example, 13 percent of work could generate 87 percent of returns. Or 70 percent of problems could be resolved by dealing with 30 percent of the causes.

How to Use the Tool

Step 1: Identify and List Problems

Firstly, write a list of all of the problems that you need to resolve. Where possible, talk to clients and team members to get their input, and draw on surveys, helpdesk logs and suchlike, where these are available.

Step 2: Identify the Root Cause of Each Problem

For each problem, identify its fundamental cause. (Techniques such as **Brainstorming** , the **5 Whys** , **Cause and Effect Analysis** , and **Root Cause Analysis** will help with this.)

Step 3: Score Problems

Now you need to score each problem. The scoring method you use depends on the sort of problem you're trying to solve.

For example, if you're trying to improve profits, you might score problems on the basis of how much they are costing you. Alternatively, if you're trying to improve customer satisfaction, you might score them on the basis of the number of complaints eliminated by solving the problem.

Step 4: Group Problems Together By Root Cause

Next, group problems together by cause. For example, if three of your problems are caused by lack of staff, put these in the same group.

Step 5: Add up the Scores for Each Group

You can now add up the scores for each cause group. The group with the top score is your highest priority, and the group with the lowest score is your lowest priority.

Step 6: Take Action

Now you need to deal with the causes of your problems, dealing with your top-priority problem, or group of problems, first.

Keep in mind that low scoring problems may not even be worth bothering with - solving these problems may cost you more than the solutions are worth.

Note:

While this approach is great for identifying the most important root cause to deal with, it doesn't take into account the cost of doing so. Where costs are significant, you'll need to use techniques such as **Cost/Benefit Analysis**, and use **IRRs and NPVs** to determine which changes you should implement.

Pareto Analysis Example

Jack has taken over a failing service center, with a host of problems that need resolving. His objective is to increase overall customer satisfaction.

He decides to score each problem by the number of complaints that the center has received for each one. (In the table below, the second column shows the problems he has listed in step 1 above, the third column shows the underlying causes identified in step 2, and the fourth column shows the number of complaints about each column identified in step 3.

| #	Problem (Step 1)	Cause (Step 2)	Score (Step 3)
1	Phones aren't answered quickly enough.	Too few service center staff.	15
2	Staff seem distracted and under pressure.	Too few service center staff.	6
3	Engineers don't appear to be well organized. They need second visits to bring extra parts.	Poor organization and preparation.	4
4	Engineers don't know what time they'll arrive. This means that customers may have to be in all day for an engineer to visit.	Poor organization and preparation.	2
5	Service center staff don't always seem to know what they're doing.	Lack of training.	30
6	When engineers visit, the customer finds that the problem could have been solved over the phone.	Lack of training.	21

Jack then groups problems together (steps 4 and 5). He scores each group by the number of complaints, and orders the list as follows:

1. **Lack of training** (items 5 and 6) – 51 complaints.
2. **Too few service center staff** (items 1 and 42) – 21 complaints.
3. **Poor organization and preparation** (items 3 and 4) – 6 complaints.

As you can see from figure 1, Jack will get the biggest benefits by providing staff with more training. Once this is done, it may be worth looking at increasing the number of staff in the call center. It's possible, however, that this won't be necessary: the number of complaints may decline, and training should help people to be more productive.

By carrying out a Pareto Analysis, Jack is able to focus on training as an issue, rather than spreading his effort over training, taking on new staff members, and possibly installing a new computer system to help engineers be more prepared.

Figure 1. Jack's Pareto Analysis
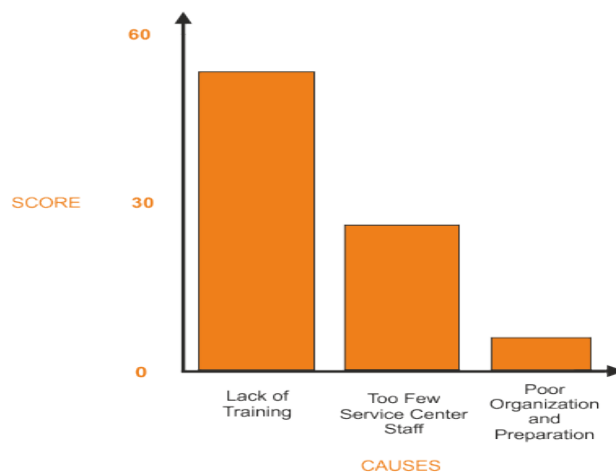
Key Points

Pareto Analysis is a simple technique for prioritizing problem-solving work so that the first piece of work you do resolved the greatest number of problems. It's based on the Pareto Principle (also known as the 80/20 Rule) – the idea that 80 percent of problems may be caused by as few as 20 percent of causes.

To use Pareto Analysis, identify and list problems and their causes. Then score each problem and group them together by their cause. Then add up the score for each group. Finally, work on finding a solution to the cause of the problems in the group with the highest score.

Pareto Analysis not only shows you the most important problem to solve, it also gives you a score showing how severe the problem is.