Cause-and-Effect Matrices

What if you want to evaluate the importance of potential causes across multiple effects? To do this, you can use a cause-and-effect matrix. In a cause-and-effect matrix, you use subjective ratings to identify the most important inputs or causes across more than one effect or output.

The causes are listed on the side, and the effects are listed across the top. In this diagram, each cause is rated from 0 to 3, where 0 is no impact and 3 is high impact. The ratings for each input are added together to provide a total rating.

You can apply a weighting if some effects are more important than others. Here, Effect 1 is the most important, and Effect 3 is the least important. You can see that the most important causes, across the different effects, are Cause 1 followed by Cause 6.

Cause-and-effect matrices are often used with process maps to identify the most important inputs or experimental factors. Consider the input/output map for anodized parts.

Suppose that you have three critical outputs: surface finish, thickness, and the color ratings. You can use a cause-and-effect matrix to identify the most important process steps. You can also change the rating scale to drive separation in the ratings. For example, you can use a 0, 1, 3, 9 scale instead. Here, Anodize Tank and Dye Tank are clearly the most important steps. You can expand this to include the inputs at the critical steps. For example, you can use a similar approach to identify the most important inputs at these two steps.

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