

TRY MULTIVARIABLE TESTING TO JUMP-START R&D

If you're experiencing quality control problems in the factory, don't waste time exploring every possible cause. The quality control consultancy QualPro has devised a technique for improving the performance of your system with the smallest possible investment in time and effort: multivariable testing (MVT).

The key to MVT lies in experimentation. When trying to improve a process, users change many variables at once and measure the consequences.

Statistically, you stand a better chance of finding the answer when you test combinations of variables. That's because in the real world, variables interact. In applications of MVT in the field, QualPro found that a full third of the variables it tested affected processes only in combination with others.

When you seriously apply multivariable testing, you may find the answer to your production problems in a few days or weeks. These seven steps will prepare you to enact MVT in your factory:

1. Create an environment where improvement is possible. Assemble a team of designers, machine operators, customers -- everybody involved in the product.
2. Decide on your "key" measure, the measurable end result that you want to improve.
3. Make sure that your measuring system is accurate.
4. Find out whether your existing production process demonstrates stability. That is, does it always generate the same flaw in the same way?
5. If not, find the source of the instability and eliminate it.
6. Search for simple solutions to the production problem before you launch full-scale MVT. It would be a shame to spend a great deal of time changing the process when the answer was obvious.
7. Stop and ask whether you've solved the problem with just these initial steps. Surprisingly less than 10% of companies who try MVT answer this question with a "yes."

Once you've finished preparations, you're ready to start actual MVT, which breaks down like this:

1. Gather the team together and brainstorm. Go around the room and ask everybody to offer ideas of how to improve the process. Ideas and opinions can disagree; you're looking to assemble a list of 50 or 60 variables that have any measurable effect on the process.
2. Categorize the variables by how practical they are to manipulate, taking issues like safety and cost into account.
3. Experiment with the variables. Combine them into groups of three or four so you don't have to run individual tests on each one.
4. Use the results to refine your experiments. If one or two of the variables caused a big improvement in the quality of your product, you'll notice. Then you can focus your efforts on experimenting only with those variables that initiate the greatest change.

With MVT, you not only discover which variables are most important to your process, but which ones are least important. Then you can reset your standards for these variables to the cheapest or lowest risk condition. If changing the grade of feed material doesn't diminish the quality of the final product, for example, why not use inexpensive material and save money? And why put much effort into parts of the process that in the end don't mean all that much?

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