

ME450: QUALITY FUNCTION DEPLOYMENT WORKSHEET #2

In this phase, Quality Function Deployment (QFD) is used as a tool for understanding, and improving your design by systematically quantifying and evaluating engineering quantities and design criteria, and benchmarking. There are many variations of QFD (try a web search). The one that we present here is simple, and it covers all of the requirements for this course. Feel free to use other QFD tools and variations to help your team design a better product. The example below shows a typical QFD table that was made for the design of a BattleBot for a previous class.

To draw a QFD chart,

1. List your design criteria in the left column. If the design criteria can be quantified, then units and target values are generally added. Each design criteria is given a weight, or relative importance.
2. List your engineering parameters across the top column and note each as increasing or decreasing (arbitrary reference). Each engineering parameter is described with a unit of measurement (bottom) and a target value (missing in this example).
3. Fill in the central with values that reflect the amount of influence that each variable has on each design criteria. In this example, decreasing the *Amount of Electronics Exposed* has a strong positive impact on the *Protection of Electrical Components*, so the corresponding matrix element is marked 9, indicating strong positive affect.
4. Fill in the upper "roof" half-matrix to represent the effect that each engineering parameter has on the others. In this example, decreasing the *Turning Radius* has a strong decreasing effect on *Time Delay Between Attacks*, so the corresponding matrix element is marked ++, indicating strong positive relationship (one supports the other).
5. Total each column by multiplying each entry by the corresponding weight. This will give a sense of the overall importance of each parameter to meeting the design criteria. A separate "Importance Rating" can be assigned to each parameter based on a team judgment-call that may be partially based on the raw total score for each parameter.
6. Benchmark your design against other market products. Often two or three representative products are enough to get a feel for how your product fits in to the market. The matrix at the far right of the chart compares your product to competitors in terms of the design criteria. Each product is rated for how well it meets each design criteria overall. Often designers will draw the comparison graphically in this space. The matrix at the far bottom compares each of your engineering parameters to your competitors. It is appropriate only if competitor products have similar design parameters.

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The following template can help you to get started analyzing your product and benchmarking it against competitors. The goals of this exercise are to help you to systematically explore relationships between design criteria and engineering quantities, to help you quantify as many aspects of your design as possible, and to help you compare your design to other products that are available. Use any system of weights and notation that works for you, but be sure to include a legend of notation.

[illegible]