

Quality Function Deployment

What: (QFD) is a planning tool that provides a systematic design process and structure that enables an enterprise to go beyond identifying the needs and wants of its customers - and beyond CTQ Characteristics. It is a systematic process that allows an organization to bring intense focus on customer's requirements.

When: Teams use QFD in the **Define** step of a Six Sigma project to identify, resolve and prioritize issues involved in providing products, processes, and services to satisfy customers needs.

How: 1) **Collect, Organize, and Clarify Customer Wants and Needs (VOC):** VOC info collected the, Affinity Diagram and Tree Diagram, that has been collected, sorted, and developed is entered on the left side of the House of Quality matrix as the WHATs - the CTQ characteristics that have been expressed by customers.

2) **List the Hows.** Enter the list of technical features across the top of the matrix. These are the HOWs, or design elements necessary to satisfy the WHATs. Through the QFD process, the technical features are vetted against one another and against the WHAT's to determine how well they satisfy the customer need.

3) **Identify relationships between Hows.** Interactions between technical features are identified by color and number. There may be either positive or negative relationships. One of the primary goals of QFD is to identify tradeoff areas that require a technological breakthrough in order to satisfy multiple or opposing customer requirements.

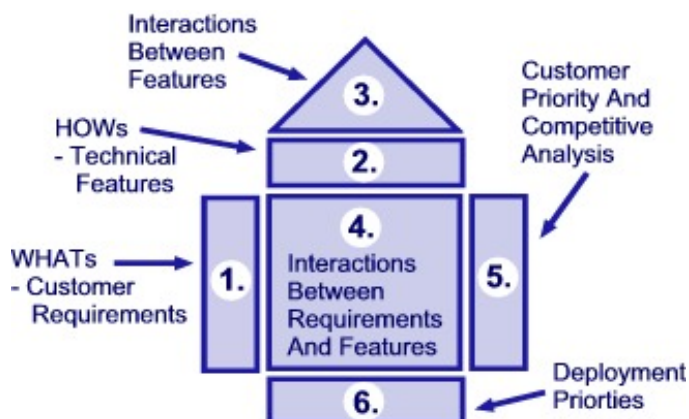
We have assigned numerical values ranging from -9 (strong negative interaction) to 9 (strong positive interaction). Different QFD models may use different symbols, and may not use numerical values. **Note:** Typically, the correlations are subjectively assigned based on prior knowledge of the process factors and their interactions.

4) Identify **relationships between Whats and Hows.** Identify and evaluate the main relationships between the WHATs and HOWs. Using a numerical and color-coded key, identify the strength of the interaction between characteristics. Those Hows that interact most strongly with the most high-priority Whats become the highest priority solutions to meet customer requirements.

5) **Benchmark competing products.** First identify the priority of each customer requirement (CTQ Characteristic). You may need to interview/survey customers to collect this priority information. We have used a 1-5 scale. Add competitive information from benchmarking analysis. This helps determine whether your design actions will yield a competitive advantage.

6) **Establish deployment priorities.**

Calculate the deployment priorities for each Technical Feature by adding the product of each interaction value (from Step 4) multiplied by the Customer Priority value. Features with the most positive relationships with high priority Customer Requirements will have a higher score. Rank the scores to get an idea which Technical Features are most important to satisfy the array of Customer Requirements. When tradeoffs between features are present, the decision should



be weighted in favor of the higher ranking feature.

QFD Example

