

## QFD-house of quality?

House of Quality is a diagram, resembling a house,[1] used for defining the relationship between customer desires and the firm/product capabilities.[2] It is a part of the Quality Function Deployment (QFD) and it utilizes a planning matrix to relate what the customer wants to how a firm (that produces the products) is going to meet those wants. It looks like a house with a "correlation matrix" as its roof, customer wants versus product features as the main part, competitor evaluation as the porch etc. It is based on "the belief that products should be designed to reflect customers' desires and tastes".[3] It also is reported to increase cross functional integration within organizations using it, especially between marketing, engineering and manufacturing.

The basic structure is a table with "Whats" as the labels on the left and "Hows" across the top. The roof is a diagonal matrix of "Hows vs. Hows" and the body of the house is a matrix of "Whats vs. Hows". Both of these matrices are filled with indicators of whether the interaction of the specific item is a strong positive, a strong negative, or somewhere in between. Additional annexes on the right side and bottom hold the "Whys" (market research, etc.) and the "How Muches". Rankings based on the Whys and the correlations can be used to calculate priorities for the Hows.

House of Quality analysis can also be cascaded, with "Hows" from one level becoming the "Whats" of a lower level; as this progresses the decisions get closer to the engineering/manufacturing details.

A Flash tutorial exists showing the build process of the traditional QFD "House of Quality" (HOQ).[4]

# **Costs of Quality**

- ◆ **Prevention costs - reducing the potential for defects**
- ◆ **Appraisal costs - evaluating products, parts, and services**
- ◆ **Internal failure - producing defective parts or service before delivery**
- ◆ **External costs - defects discovered after delivery**

## ***Seven Concepts of TQM***

- 1. Continuous improvement**
- 2. Six Sigma**
- 3. Employee empowerment**
- 4. Benchmarking**
- 5. Just-in-time (JIT)**
- 6. Taguchi concepts**
- 7. Knowledge of TQM tools**

### ***Continuous Improvement***

- ◆ **Represents continual improvement of all processes**
- ◆ **Involves all operations and work centers including suppliers and customers**
  - ◆ **People, Equipment, Materials, Procedures**

### ***Six Sigma***

- ◆ **Two meanings**
  - ◆ **Statistical definition of a process that is 99.9997% capable, 3.4 defects per million opportunities (DPMO)**
  - ◆ **A program designed to reduce defects, lower costs, and improve customer satisfaction**

## ***Employee Empowerment***

- ◆ **Getting employees involved in product and process improvements**
  - ◆ **85% of quality problems are due to process and material**
- ◆ **Techniques**
  - ◆ **Build communication networks that include employees**
  - ◆ **Develop open, supportive supervisors**
  - ◆ **Move responsibility to employees**
  - ◆ **Build a high-morale organization**
  - ◆ **Create formal team structures**

## ***Benchmarking***

**Selecting best practices to use as a standard for performance**

- 1. Determine what to benchmark**
- 2. Form a benchmark team**
- 3. Identify benchmarking partners**
- 4. Collect and analyze benchmarking information**
- 5. Take action to match or exceed the benchmark**

## ***Just-in-Time (JIT)***

- ◆ ‘Pull’ system of production scheduling including supply management
  - ◆ Production only when signaled
- ◆ Allows reduced inventory levels
  - ◆ Inventory costs money and hides process and material problems
- ◆ Encourages improved process and product quality
- ◆ Relationship to quality:
- ◆ JIT cuts the cost of quality
- ◆ JIT improves quality
- ◆ Better quality means less inventory and better, easier-to-employ JIT system

## ***Taguchi Concepts***

- ◆ Engineering and experimental design methods to improve product and process design
  - ◆ Identify key component and process variables affecting product variation
- ◆ Taguchi Concepts
  - ◆ Quality robustness
  - ◆ Quality loss function
  - ◆ Target-oriented quality

## ***Tools of TQM***

### **◆ Tools for Generating Ideas**

- ◆ Check sheets**

- ◆ Scatter diagrams**

- ◆ Cause-and-effect diagrams**

### **◆ Tools to Organize the Data**

- ◆ Pareto charts**

- ◆ Flowcharts**

### **◆ Tools for Identifying Problems**

- ◆ Histogram**

- ◆ Statistical process control chart**