Introduction to Quality Function Deployment (QFD)
What is QFD?

Quality Function Deployment (QFD) is a structured method for listening to the customers and optimizing designs, materials and processes to ensure the customers’ expectations are best satisfied. Optimal Thinking® is the core of all activities.
QFD Benefits

• Shortest Cycle Time
• Best Quality
• Lowest Cost
• Best Customer Satisfaction
QFD - History

- 1966 - Yogi Akao proposes concept
- 1969 - First magazine article
- 1972 - Concept of deployment is developed
- 1972 - KOBE Shipyards using Quality Tables
- 1977 - Toyota uses QFD in their design process
- 1984 - Dr. Clausing (Xerox to Ford) begins advocating QFD
- 1988 - Clausing & Hauser QFD article published in Harvard Business Review
QFD Matrix Basics
Sample Applications

- Design of new or existing products
- Design of new or existing services
- Development of design requirements
- Selection of decision alternatives
- Selection of points of manufacturing
- Selection of points of service
- Selection of key suppliers
- Trade studies
Product or Service Design
QFD Application
Product or Service Design
House of Quality
Waterfall Deployment

REQUIREMENTS MATRIX

Customer Requirements

Design Requirements

DESIGN MATRIX

Engineering Design

PRODUCT CHARACTERISTICS MATRIX

Product Characteristics

MANUFACTURING & PURCHASING MATRIX

Manufacturing / Purchasing Operations

PROCESS & PRODUCT CONTROL MATRIX

Production / Quality Controls

MANUFACTURING & PURCHASING MATRIX

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MANUFACTURING & PURCHASING MATRIX

Manufacturing / Purchasing Operations
Point of Manufacturing
QFD Application
Product or Service Design QFD Process

1. Identify customer requirements (WHATs) using affinity diagrams
2. Determine customer importance rating for each of the requirements
3. Determine best value for each of the customer requirements
4. Identify design requirements (HOWs) using affinity diagrams
5. Determine target value for each of the design requirements
6. Determine how design requirements satisfy each of the customer requirements (9 = strong; 3 = medium; 1 = weak; blank = no relationship)
7. Determine correlation of design requirements to each other
8. Calculate weighted scores and determine optimal requirements
9. Perform sensitivity analysis of importance ratings and relationship scores
Point of Manufacturing
House of Quality
1. Identify decision criteria (WHATs) using affinity diagrams
2. Determine importance rating for each of the decision criteria
3. Determine best value for each of the decision criteria
4. Identify POM alternatives (HOWs) using affinity diagrams
5. Determine how POM alternatives satisfy each of the decision criteria (9 = strong; 3 = medium; 1 = weak; blank = no relationship)
6. Determine interaction of POM alternatives with each other
7. Calculate weighted scores for each of the POM alternatives
8. Calculate weighted scores and determine best POM alternative
9. Perform sensitivity analysis of importance ratings and relationship scores
Trade Study

QFD Application
Trade Study
House of Quality
Trade Study QFD Process

1. Identify customer requirements (WHAT's) using affinity diagrams
2. Determine customer importance rating for each of the requirements (Balanced among performance, life cycle cost and supportability)
3. Determine best value for each of the requirements
4. Identify solution alternatives (HOW's) using affinity diagrams
5. Determine how solution alternatives satisfy each of the customer requirements based on technical data (9 = strong; 3 = medium; 1 = weak; blank = no relationship)
6. Determine correlations of solution alternatives to each other
7. Calculate absolute and relative scores for each alternative
8. Analyze, rank and select best alternative
9. Perform sensitivity analysis of importance rating and relationship scores
QFD Applications

"As with any versatile tool, the applications of QFD are limited only by one’s imagination."

Lou Cohen - “Quality Function Deployment - How to Make QFD Work for You”
Summary

• Structured QFD approach is key to success in meeting customer requirements
• Team membership must include all stakeholders
• Assures best understanding of customer requirements or decision criteria
• Flexible, robust and proactive methodology helps in making optimal balanced decisions
• Sensitivity analysis provides a means to explore different scenarios
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